Final Environmental Assessment

Western Range Instrumentation Modernization Program

Vandenberg Air Force Base, Santa Barbara County, and Pillar Point Air Force Station, San Mateo County California

3 September 2008

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FINDING OF NO SIGNIFICANT IMPACT

Western Range Instrumentation Modernization Program
Vandenberg Air Force Base, Santa Barbara County, and
Pillar Point Air Force Station, San Mateo County
California

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code 4321 *et seq.*, implementing Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process*, the United States Air Force (Air Force) conducted an assessment of the potential environmental consequences associated with the Western Range Instrumentation Modernization Program on Vandenberg Air Force Base (AFB), and Pillar Point Air Force Station (AFS), California.

The 30th Space Wing at Vandenberg AFB operates the Western Launch and Test Range (Western Range). The Western Range begins at the coastal boundaries of Vandenberg AFB and extends westward to the Marshall Islands, including sites in Hawaii. It provides for the safe and effective launch, testing and tracking of Department of Defense, civil, commercial, and international space lift vehicles, in addition to conducting ballistic missile, guided weapon, and aeronautical test and evaluation over the Pacific Ocean, west of Vandenberg AFB.

Vandenberg AFB is headquarters to the 30th Space Wing, the Air Force Space Command unit that operates Vandenberg AFB and the Western Range. Vandenberg AFB operates as a missile test base and aerospace center, supporting west coast space launch activities for the Air Force, Department of Defense, National Aeronautics and Space Administration, and commercial contractors. Vandenberg AFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco. The 99,000-acre base extends along approximately 35 miles of the Santa Barbara County coastline.

Pillar Point Air Force Station (AFS) is a tracking station that supports polar-orbiting space satellite and operational intercontinental ballistic missile launches from Vandenberg AFB. Operations at Pillar Point AFS include radar tracking, telemetry reception, command control, and communication services to support these launch operations. The 30th Space Wing administers Pillar Point AFS. Pillar Point AFS is located on the Pacific Ocean side of the San Francisco Peninsula in northern California, approximately 20 miles south of San Francisco and 42 miles north of Santa Cruz. The 55-acre parcel is situated on a peninsula of land at the north end of Half Moon Bay due west of the town of Princeton-by-the-Sea and Pillar Point Harbor, in San Mateo County.

The Air Force, national security, civil, and commercial sectors have reached consensus that the United States launch infrastructure and technologies have not kept pace with the changing launch business. Much of the equipment and systems at the ranges were installed in the 1950s and 1960s and are still used today. Nearly 25 percent of the components required for the range

would be installed (totaling approximately 31 feet in height). Ancillary equipment would be housed in existing structures. All utilities would be trenched from the support buildings to each of the new antennas.

The telemetry receiving station would be upgraded with a new telemetry antenna (TM-B) with radome assembly (approximately 76 feet tall). Building 9 would be demolished and this new antenna would be placed at this location. A paved asphalt service road would be constructed to provide access to the antenna. Electrical and communication lines to the new antenna from supporting equipment and buildings would be trenched.

Also under consideration is the construction of a new 500 square foot concrete masonry unit block structure to house ancillary equipment, and installation of a 2,000 gallon above ground oil storage tank on a concrete pad east of Building 17, in support of the fixed, land-based radar tracking system, AN/FPQ-6.

SUMMARY OF FINDINGS

The analyses of the affected environment and environmental consequences of implementing the Proposed Action presented in the EA concluded that with implementation of the environmental protection and monitoring measures described in the corresponding sections of Chapter 4, no adverse effects should result to Air Quality (Section 4.1), Biological Resources (Section 4.2), Hazardous Materials and Hazardous Waste Management (Section 4.4), Human Health and Safety (Section 4.5), Solid Waste Management (Section 4.6), Transportation (Section 4.7), and Water Resources (Section 4.8). In addition, the EA considered but did not analyze Earth Resources, Environmental Justice, Land Use, and Socioeconomics because the Proposed Action would have no effect on these resources.

Federal agencies are required to ensure that projects which directly affect the Coastal Zone are undertaken in a manner consistent to the maximum extent practicable with approved State management programs. The California Coastal Commission concurred with a Federal Consistency Determination for project related aspects at Pillar Point AFS on 9 May 2008 and with a Negative Determination for project related aspects on Vandenberg AFB on 30 June 2008.

A General Conformity Rule Analysis was conducted IAW the requirements of 40 CFR 93.153(b) (1) & (2). Based upon a determination that associated project emissions were both de minimis and regionally insignificant the General Conformity Rule is not applicable.

No adverse cumulative impacts are anticipated from activities associated with the Proposed Action, when considered with recent past and future projects within the project area (Section 4.9).

Cultural Resources

Archaeological surveys found no evidence of prehistoric or historical resources in the areas to be affected by the proposed work at any of the project locations. At Oak Mountain on Vandenberg AFB, two facilities evaluated as eligible to be listed in the National Register of Historic Places (NRHP) would be affected: The ATTAS antenna, which would be demolished

FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment
Western Range Instrumentation Modernization Program, Vandenberg Air Force Base, Santa Barbara County, and Pillar Point Air Force Station, San Mateo County, California

APPROVAL:

Chris Puckett 30 Oct 2003

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Final Environmental Assessment

Western Range Instrumentation Modernization Program

Vandenberg Air Force Base, Santa Barbara County, and Pillar Point Air Force Station, San Mateo County California

Prepared for:

Department of the Air Force
Space and Missile Systems Center
Los Angeles Air Force Base, California

3 September 2008

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Acronyms and Abbreviations

º	Degrees
ºF	Degrees Farenheit
µg/m^3	Micrograms per cubic meter
30 CES	30th Civil Engineer Squadron
30 CES/CC	30th Civil Engineer Squadron Commander
30 CES/CD	30th Civil Engineer Squadron Deputy Commander
30 CES/CEV	30th Space Wing Environmental Flight
30 MDOS/SGOAB	30th Medical Operations Squadron, Bioenvironmental Engineering Element
30 SW	30th Space Wing
30 SW/SE	30th Space Wing Safety Office
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos containing material
AF	United States Air Force
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
Air Force	United States Air Force
AMP	Asbestos Management Plan
AOC	Area of Concern
AOI	Area of Interest
APCD	Air Pollution Control District
APE	Area of potential effects
BAAB	Bay Area Air Basin
BAAQMD	Bay Area Air Quality Management District
Base	Vandenberg Air Force Base
bgs	Below ground surface
BMP	Best management practices
C&D	Construction and demolition
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
Cal EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CCA	California Coastal Act
CCC	California Coastal Commission
CCIC	Central Coast Information Center
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIP	Capital Improvements Program
CITS	Combat Information Transport System
CIWMB	California Integrated Waste Management Board
CMU	Concrete masonry units
CO	Carbon monoxide
CT	Command transmit
CWA	Clean Water Act
CZMA	Coastal Zone Management Act

dB	Decibel
dBA	A-weighted Decibel
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EMS	Environmental Management System
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
FCC	Federal Communications Commission
FFSRA	Federal Facilities Site Remediation Agreement
Fisheries Service	National Marine Fisheries Service
FONSI	Finding of No Significant Impact
ft	Feet
ft^2	Square feet
ft^3	Cubic feet
FY	Fiscal year
GHz	Gigahertz
GIS	Geographic Information System
HazMart	Hazardous Materials Pharmacy
HPP	Historic Preservation Plan for the Management and Treatment of Cold War Properties at Vandenberg Air Force Base, California
HS	Hydrogen sulfide
IEEE	Institute of Electrical and Electronics Engineers
IMP	Instrumentation Modernization Program
IRP	Installation Restoration Program
JTD	Joint Technical Document
kHz	Kilohertz
KVA	Kilovolt amp
Kw	Kilowatt
LBP	Lead-based paint
lbs/day	Pounds per day
LEA	Local enforcement agency
L_{eq1H}	One-hour average sound level
LOS	Level of Service
LRRG	Launch and Range, Range Group
mg/kg	Milligrams per kilogram
mg/L	Milligram per liter
msl	Mean sea level
MSRS	ManTech SRS Technologies, Inc.
NAAQS	National Ambient Air Quality Standards
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOx	Oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places

NSR	New Source Review
NWIC	Northwest Information Center
O&M	Operations and maintenance
O_3	Ozone
OET	Office of Engineering and Technology
OSHA	Occupational Safety and Health Administration
P2	Pollution Prevention
PA	Programmatic Agreement
Pb	Lead
PBA	Programmatic Biological Assessment
PCB	Polychlorinated byphenyl
PCDD	Polychlorinated dibenzo dioxins
PCDF	Polychlorinated dibenzo furans
PERP	Portable Equipment Registration Program
PM_{10}	Particulate matter less than or equal to 10 microns in diameter
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in diameter
POLs	Petroleum, oil, and lubricants
PPA	Pollution Prevention Act
PPAFS	Pillar Point Air Force Station
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RF	Radio Frequency
RFR	Radio Frequency Radiation
ROG	Reactive organic gases
ROI	Region of Influence
RTDS	Reutilization, transfer, donation and sale
RWD	Report of Waste Discharge
RWQCB	Regional Water Quality Control Board
SAIC	Science Applications International Corporation
SBCAPCD	Santa Barbara County Air Pollution Control District
SCAQMD	South Coast Air Quality Management District
SCCAB	South Central Coast Air Basin
SEL	Sound exposure level
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_4	Sulfates
SR	State Route
SRS	SRS Technologies, Inc.
STP	Shovel test pit
SWFP	Solid Waste Facility Permit
SWP	Space Wing Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCE	Trichloroethylene
TEU	Test excavation unit
TM	Telemetry
Tons/day	Tons per day
Tons/yr	Tons per year
TPH	Total petroleum hydrocarbons
TSCA	Toxic Substances Control Act

TTLC	Total threshold limit concentration
UCSB	University of California, Santa Barbara
UPS	Uninterruptible power supply
U.S.	United States
USACERL	U.S. Army Construction Engineering Research Laboratories
USAF	United States Air Force
U.S.C.	United States Code
USFWS	United States Fish and Wildlife Service
V/C	Traffic volume to roadway capacity
VAFB Landfill	Vandenberg Air Force Base Sanitary Landfill
VAFB	Vandenberg Air Force Base
VOC	Volatile organic compound
VTRS	Vandenberg Telemetry Receiving Station
WDR	Waste Discharge Requirement
WET	Waste Extraction Test
WRCC	Western Regional Climatic Center
WRLISSHD	Western Range Land Based Instrumentation Support Systems Historic District
WR	Western Range
yd^3	Cubic yard

Chapter 1. Introduction: Purpose of and Need for the Proposed Action

This Environmental Assessment (EA) evaluates the potential environmental impacts associated with the Western Range Instrumentation Modernization Program. The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations require lead agencies to evaluate the potential impacts of federal actions on the surrounding environment. The United States Air Force (Air Force, USAF, or AF) is the lead agency for NEPA compliance on the proposed project.

This EA has been prepared per the NEPA of 1969, as amended (42 United States Code [U.S.C.] 4321 et seq.); as implemented by CEQ Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); and 32 CFR Part 989.

1.1 Introduction

A space launch and test range is a large area associated with a rocket launch site. The range includes the area over which launched rockets are anticipated to fly, and within which components of the rockets may land. Tracking stations, vessels, and aircraft that assess the progress of the launches are located within the range.

The Western Launch and Test Range, hereafter referred to as the Western Range (WR), is operated by the 30th Space Wing at Vandenberg Air Force Base (VAFB or Base), California. The WR begins at the coastal boundaries of VAFB and extends westward to the Marshall Islands, including sites in Hawaii. The WR provides for the safe and effective launch, testing, and tracking of Department of Defense (DoD), civil, commercial, and international space lift vehicles, in addition to conducting ballistic missile, guided weapon, and aeronautical test and evaluation over the Pacific Ocean, west of VAFB.

The WR consists of a collection of sensors operated out of a number of locations along the west coast, as well as support infrastructure, control, timing, scheduling, and data handling systems. The sensor suite consist of optical, radar, telemetry, radio frequency monitor, and area surveillance systems. Communication systems link all sites within the range, and to a central command site at VAFB, that ensures the safe operation of space vehicles within the WR. The integrated capabilities of the range handles metric data, telemetry data, command/destruct messages, weather data, imaging data, launch area surveillance data, impact location data, network communications, timing, and radio frequency spectra data.

1.2 Purpose of the Proposed Action

The WR Instrumentation Modernization Program (IMP) provides procurement capabilities used to develop and acquire new range systems. The largest portion of this effort is to procure and install range systems to replace antiquated equipment for which replacement parts are unavailable, add new capabilities needed by range users, and meet overall logistics, operability, and supportability objectives.

As part of the IMP, the Air Force's Launch and Range, Range Group (LRRG) proposes to install new equipment on Pillar Point Air Force Station (PPAFS) in San Mateo County, California; and on VAFB, in Santa Barbara County, California, and decommission and remove existing outdated components. These activities would occur over a 2-year period, starting in 2008.

1.3 Need for the Proposed Action

The Air Force, national security, civil, and commercial sectors have reached consensus that the United States (U.S.) launch infrastructure and technologies have not kept pace with the changing launch business. Much of the equipment and systems at the ranges (such as tracking radars, telemetry systems, and fixed optical systems) were installed in the 1950s and 1960s and are still used today. Nearly 25 percent of the components required for the range systems are deemed obsolete and have no source of spares.

In addition, the rapid reconfiguration of the launch ranges from one launch to the next is a much needed capability. This capability is frustrated by out-of-date technologies and an architecture not equipped to handle the continuing changes in space transportation. This capability is an important element to accommodating future commercial launch demands.

The Proposed Action would update the current antiquated systems to ensure the safe operation of space vehicles within the WR. Previously generated environmental documents in support of this effort include the *Final Environmental Assessment, Western Range Command Transmit Site, Vandenberg Air Force Base, California* (USAF 2005).

1.4 Scope of the Environmental Assessment

This EA describes and addresses the potential environmental effects of implementing the Proposed Action and No-Action Alternative. No other action alternatives were deemed feasible due to mission requirements. Resources potentially impacted are considered in more detail to determine whether additional analysis is required pursuant to 40 CFR Part 1501.4(c).

The resources analyzed in this EA include air quality, biological and cultural resources, hazardous materials and hazardous waste management, human health and safety, solid waste management, transportation, and water resources.

Earth resources were considered but not analyzed in this EA because the construction methods that would be used for installing the components to modernize the WR IMP are not anticipated to result in any effects on geology or soils. Excavation would not exceed 8 feet (ft) in depth for any of the components described in this EA (see Chapter 2). Tsunami or liquefaction hazards in project areas are not anticipated. The operational phase of the Proposed Action would have no effect on earth resources.

Per Executive Order (EO) 12898, *Environmental Justice*, the potential effects of the Proposed Action on minority communities and low-income communities were considered. However, because the Proposed Action (construction and operational phases) would occur within the boundaries of VAFB and the ancillary site at PPAFS, the project would not affect low-income or minority populations within the region of influence for each of the sites (Lompoc and Santa Maria Valleys for VAFB, and the Half Moon Bay area for PPAFS).

Land use was considered but not analyzed in this EA because the Proposed Action (construction and operational phase) would not change land use or affect land use planning at any of the locations. Additionally, there would be no conversion of prime agricultural land to other uses, and no decrease in its productivity. Finally, the Proposed Action would not conflict with environmental plans or goals, Air Force regulations, permit requirements, or existing uses of the project area or other properties.

While land use would not be affected, one aspect of land use, the management of the coastal zone, merits further discussion. Federal activity in, or affecting, a coastal zone requires preparation of a Coastal Zone Consistency Determination or a Negative Determination, per the federal Coastal Zone Management Act (CZMA) of 1972. The

California Coastal Zone Management Program was formed through the California Coastal Act (CCA) of 1972. The Air Force is responsible for making final coastal zone consistency determinations for its activities within the state. The California Coastal Commission (CCC) reviews federally authorized projects for consistency with the California Coastal Zone Management Program. The sites on VAFB where the Proposed Action would occur are not within the California Coastal Zone. However, PPAFS is within the California Coastal Zone and would be subject to consistency with the CZMA.

The CZMA and CCA mandate that the scenic and visual qualities of coastal areas be considered and protected as a resource of public importance. The components to be constructed and installed as part of the WR IMP would occur within already disturbed or developed areas. However, installation of radomes may be considered an impact under the CZMA. On 9 May 2008 the CCC concurred with a Federal Consistency Determination (CD-013-08) for project related aspects at PPAFS. The Air Force also submitted a Negative Determination to the CCC for project related aspects at VAFB. The CCC concurred with this determination (ND-039-08) on 30 June 2008.

Socioeconomics were considered, but are not analyzed, in this EA because the number of personnel needed for construction and installation of components (three to five at each site) would not affect socioeconomic conditions. During the operational phase, personnel currently working at existing facilities on VAFB and PPAFS would operate the new equipment. Thus, the Proposed Action would have no effect on the socioeconomic status of the areas surrounding either VAFB or PPAFS.

Lastly, because no wetlands or waters of the U.S. are present within any of the project areas described under the Proposed Action, their discussion is not relevant to the Proposed Action and is dismissed from further consideration.

1.4.1 Vandenberg Air Force Base

VAFB is headquarters for the 30th Space Wing (30 SW). The Air Force's primary missions at VAFB are to launch and track satellites in space, test and evaluate America's intercontinental ballistic missile systems, and support aircraft operations in the WR. As a non-military facet of operations, VAFB is also committed to promoting commercial space launch ventures.

VAFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco (Figure 1.1). The installation covers approximately 99,000 acres in western Santa Barbara County (VAFB 2007) and is located in a transitional ecological region that includes the northern and southern distributional limits for many plant and animal species. The Santa Ynez River and State Route (SR) 246 divide VAFB into two distinct parts – North VAFB and South VAFB.

The Proposed Action would include installation of one telemetry ground mount antenna with radome assembly and one uninterruptible power supply (UPS) building on Oak Mountain (South Base).

1.4.2 Pillar Point Air Force Station

PPAFS is a tracking station that supports polar-orbiting space satellite and operational intercontinental ballistic missile launches from VAFB. Operations at PPAFS include radar tracking, telemetry reception, command control, and communication services in support of these polar launch operations. The 30 SW administers PPAFS.

PPAFS is located on the Pacific Ocean side of the San Francisco Peninsula in northern California, approximately 20 miles south of San Francisco and 42 miles north of Santa Cruz (Figure 1.2). The 55-acre parcel is situated on a peninsula of land at the north end of Half Moon Bay due west of the town of Princeton-by-the-Sea and Pillar Point Harbor, in San Mateo County.

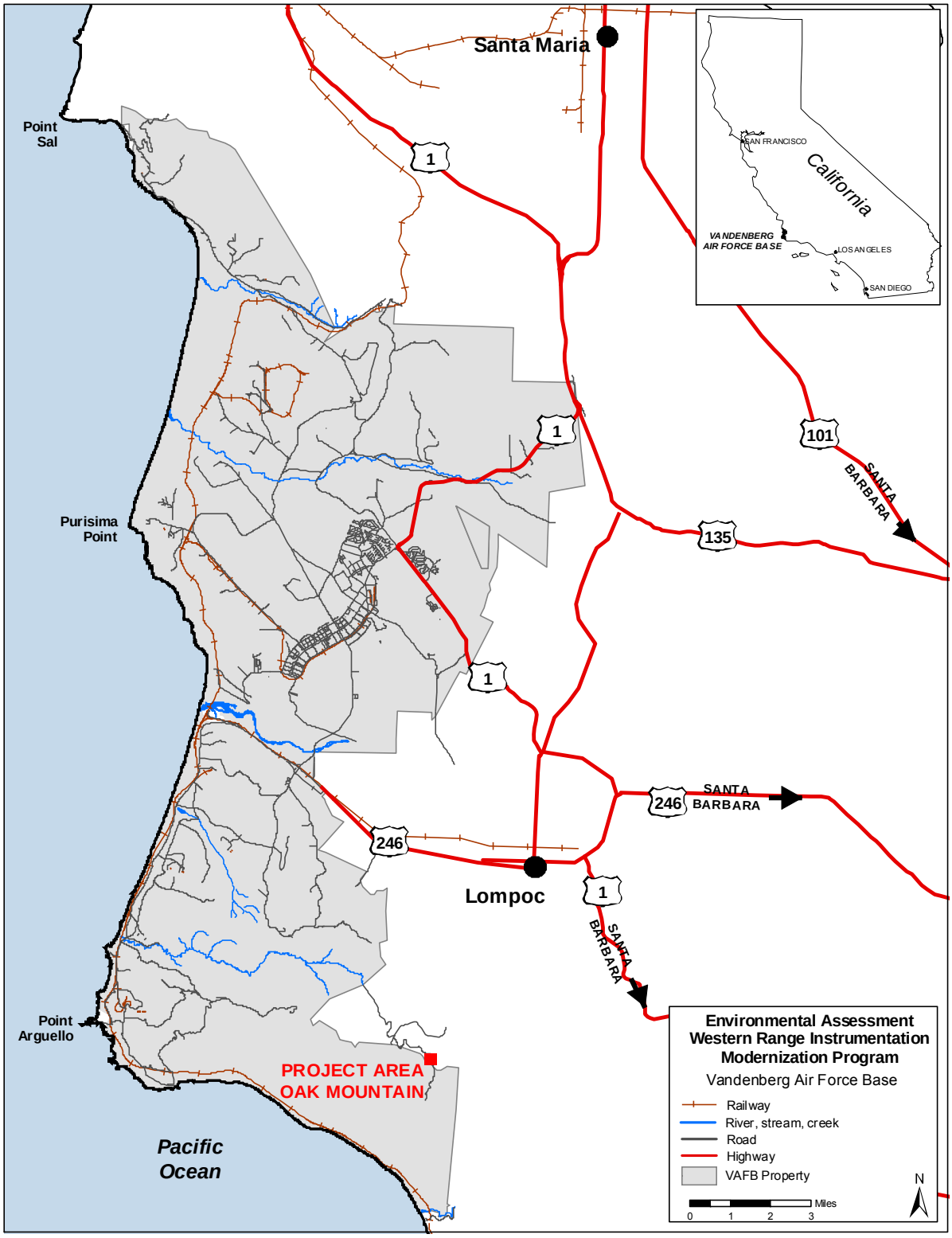

Figure 1.1: Regional map of VAFB and surrounding area.

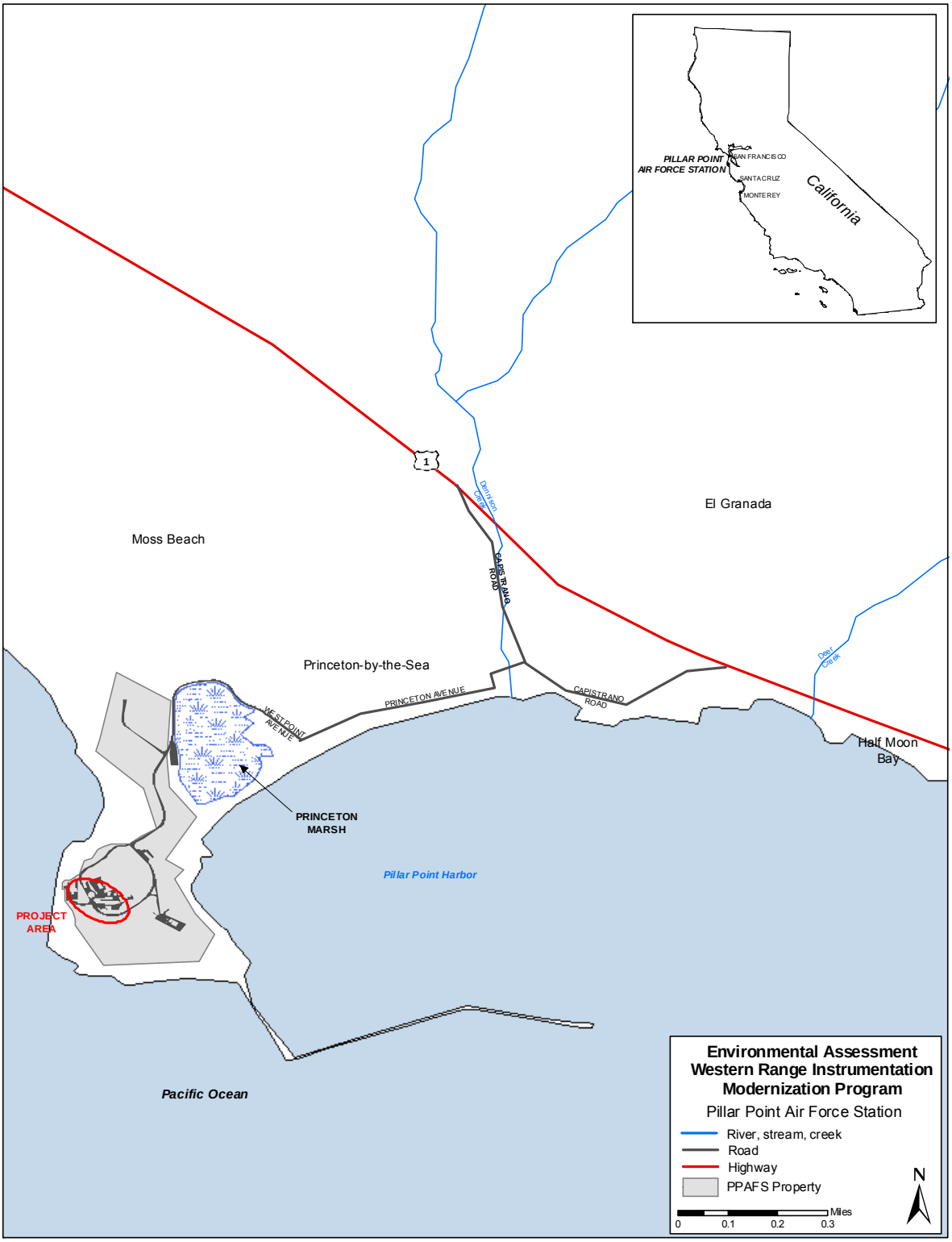

Figure 1.2: Regional map of PPAFS and surrounding area.

The Proposed Action would include three components at PPAFS:

- Installation of two ground mount command transmit (CT) antennas with radome assembly.
- Installation of a concrete masonry unit addition to Building 17.
- Installation of a new telemetry antenna and radome assembly and demolition and disposal of Building 9.

1.5 Decision to be Made

Based on the analysis of potential environmental impacts presented in this EA, the USAF must decide whether to proceed with implementing the WR IMP at VAFB and PPAFS as described under the Proposed Action, or select the No-Action Alternative.

1.6 Interagency Coordination and Consultations

During the review period of the Final Draft EA, regulatory agencies, including the appropriate field offices of the United States Fish and Wildlife Service (USFWS), the California Coastal Commission, the California State Historic Preservation Officer (SHPO), the Santa Barbara County Air Pollution Control District (SBCAPCD), the Bay Area Air Quality Management District (BAAQMD), the Central Coast Regional Water Quality Control Board (RWQCB), and the San Francisco RWQCB, were provided the opportunity to comment on the document. A list of agencies, organizations, officials, and individuals that received a copy of the Final Draft EA and Finding of No Significant Impact (FONSI) for review is included in Chapter 7 of this EA.

The 30th Space Wing Environmental Flight (30 CES/CEV) obtained concurrence from the SHPO with a no-adverse-effect determination due to upgrades planned on historic Cold War properties at Oak Mountain, on VAFB. As such, the Proposed Action is compliant with Section 106 of the National Historic Preservation Act (NHPA).

On 9 May 2008 the CCC concurred with a Federal Consistency Determination for project related aspects at PPAFS, and on 30 June 2008 the CCC concurred with a Negative Determination for project related aspects at VAFB.

1.7 Public Notification and Review

In accordance with CEQ Regulations (40 CFR Parts 1500-1508) and 32 CFR Part 989, the USAF solicited comments on the Final Draft EA from interested and affected parties. A Notice of Availability for the Final Draft EA and FONSI was published in local newspapers for VAFB and PPAFS (see Table 1.1), announcing the 30-day review and comment period. As part of this effort, copies of the Final Draft EA and FONSI were distributed to local libraries and offices (see Chapter 7). No comments were received during this public review.

Table 1.1: Newspaper publications for the Notice of Availability.

City/Town	Newspaper	Date
Santa Maria	Santa Maria Times	June 16, 17, and 18, 2008
Lompoc	Lompoc Record	June 16, 17, and 18, 2008
Santa Barbara	Santa Barbara News Press	June 16, 17, and 18, 2008
Half Moon Bay	Half Moon Bay Review	June 18 and 25, and July 2, 2008
Pacifica	Pacifica Tribune	June 18 and 25, and July 2, 2008
San Mateo	County Times	June 18 and 25, and July 2, 2008
San Mateo	Daily Journal	June 16, 17, and 18, 2008

1.8 Applicable Regulatory Requirements

Federal and state regulatory requirements that would affect the implementation of the Proposed Action and No-Action Alternative are presented in Table 1.2.

A list of acronyms used in this EA can be found following the Table of Contents.

Table 1.2: Federal and state regulations applicable to the implementation of the Proposed Action.

Federal Regulation	Activity or Requirement
American Indian Religious Freedom Act of 1978 (42 U.S.C 1996)	The American Indian Religious Freedom Act states that the policies and procedures of federal agencies must comply with the constitutional clause prohibiting abridgment of religious freedom—including freedom of belief, expression, and exercise—for Native Americans. The American Indian Religious Freedom Act policy is to consider Native American access to sites, use and possession of sacred objects, and freedom to worship, and directs federal agencies to revise policies and procedures to correct conflicts with Native American religious cultural rights and practices.
Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a et seq.)	The Archaeological and Historic Preservation Act is directed toward the preservation of historic and archaeological data that would otherwise be lost as a result of federal construction or other federally licensed or assisted activities. The Archaeological and Historic Preservation Act authorizes the Department of the Interior to undertake recovery, protection, and preservation of archaeological or historic data.
Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-mm), Supplemental Regulations of 1984	The Archaeological Resources Protection Act secures protection of archaeological resources and sites on public and Indian lands; requires permitting for any excavation or collection of archaeological material from these lands; provides civil and criminal penalties for violations.
Clean Air Act of 1970 (42 U.S.C. 7401 et seq.)	The Clean Air Act states that applicable national ambient air quality standards must be maintained during the operation of any emission source. National Ambient Air Quality Standards include primary and secondary standards for various pollutants. The primary standards are mandated by the Clean Air Act to protect public health, while the secondary standards are intended to protect the public welfare from adverse impacts of pollution, such as visibility impairment.
Clean Air Act Amendments of 1990	These amendments establish new federal non-attainment classifications, new emissions control requirements, and new compliance dates for areas in non-attainment. The requirements and compliance dates are based on the non-attainment classification.
Clean Water Act of 1977 as amended (33 U.S.C. 1251 et seq.)	Prohibits the discharge of pollutants from a point source into navigable Waters of the US, except in compliance with a National Pollutant Discharge Elimination System (40 CFR Part 122) permit. The navigable Waters of the US are considered to encompass any body of water whose use, degradation, or destruction will affect interstate or foreign commerce. Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including wetlands. Activities in waters of the US that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports), and conversion of wetlands to uplands for farming and forestry. Section 401 of the Clean Water Act requires that the discharge of dredged or fill material into water of the U.S. does not violate state water quality standards. Generally, no Clean Water Act Sec. 404 permits will be issued until the State has been notified and the applicant has obtained a certification of state water quality standards.
Coastal Zone Management Act of 1972 (16 U.S.C. 2452-24645).	The Coastal Zone Management Act plays a significant role in water quality management. Under the Act, a federal action that may affect the coastal zone must be carried out in a manner that is consistent with state coastal zone management programs.
Endangered Species Act of 1973 (7 U.S.C. 136; 16 U.S.C. 460 et seq.)	Declares the intention of Congress to conserve threatened and endangered species and the ecosystems on which these species depend. The Endangered Species Act requires that federal agencies, in consultation with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration National Marine Fisheries Service, use their authorities in furtherance of its purposes by carrying out programs for the conservation of endangered or threatened species.

Federal Regulation	Activity or Requirement
Section 7 of the Endangered Species Act (16 U.S.C. 1536)	Contains provisions that require federal agencies to consult with the Secretary of Interior and to take necessary actions to ensure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of endangered species and threatened species.
Energy Policy Act of 1992 as amended (42 U.S.C. 8256 et seq.)	The Energy Policy Act requires that federal agencies significantly reduce their use of energy and reduce environmental impacts by promoting the use of energy-efficient and renewable energy technologies.
Migratory Bird Treaty Act of 1918 as amended (16 U.S.C. 703-712)	The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful.
National Environmental Policy Act of 1969 as amended (42 U.S.C. 4321-4347)	Requires federal agencies to analyze the potential environmental impacts of major federal actions and alternatives and to use these analyses as a decision-making tool on whether and how to proceed.
National Historic Preservation Act of 1966 as amended (16 U.S.C. 470 et seq.)	The National Historic Preservation Act is the key federal law establishing the foundation and framework for historic preservation in the U.S. The Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places, establishes an Advisory Council on Historic Preservation as an independent federal entity; requires federal agencies to take into account the effects of their undertakings on historic properties, and to afford the Council an opportunity to comment upon any undertaking that may affect properties listed, or eligible for listing, in the Register; and makes the heads of all federal agencies responsible for the preservation of historic properties owned or controlled by them.
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001-3013)	The Native American Graves Protection and Repatriation Act restores certain rights to Native Americans with respect to the disposition of ancestral human remains and cultural objects; vests ownership of these materials (from federal or tribal lands) with designated Native American groups; requires notification of federal agency head when Native American cultural items are discovered on federal or tribal lands; prohibits trafficking in Native American human remains and cultural items; requires inventory and tribal notification of human remains and associated funerary objects held in existing collections by museums or federal agencies; provides for repatriation of these materials.
Noise Control Act of 1972 (42 U.S.C. 4901 et seq.)	The Noise Control Act establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. To accomplish this, the Act establishes a means for the coordination of federal research and activities in noise control, authorizes the establishment of federal noise emissions standards for products distributed in commerce, and provides information to the public respecting the noise emission and noise reduction characteristics of such products. The Act authorizes and directs that federal agencies, to the fullest extent consistent with their authority under federal laws administered by them, carry out the programs within their control in such a manner as to further the policy declared in 42 U.S.C. 4901. Each department, agency, or instrumentality of the executive, legislative and judicial branches of the federal government having jurisdiction over any property or facility or engaged in any activity resulting, or which may result in, the emission of noise shall comply with federal, state, interstate, and local requirements respecting control and abatement of environmental noise.
Pollution Prevention Act of 1990	The Pollution Prevention Act establishes that pollution should be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and that disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.
Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901 et seq.)	The Resource Conservation and Recovery Act gives the U.S. Environmental Protection Agency the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. The Act also sets forth a framework for the management of non-hazardous wastes.
State Regulation	**Activity or Requirement**
California Coastal Act of 1976	The California Coastal Act provides long-term protection of California's 1,100-mile coastline for the benefit of current and future generations. Coastal Act policies constitute the standards used by the Coastal Commission in its coastal development permit decisions and for the review of local coastal programs prepared by local governments and submitted to the Commission for approval. These policies are also used by the Commission to review federal activities that affect the coastal zone.

State Regulation	Activity or Requirement
Clean Air Act of 1988	The Clean Air Act develops and implements a program to attain the California Ambient Air Quality Standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter less than or equal to 10 microns in diameter, lead, sulfates, hydrogen sulfide, and vinyl chloride. 40 CFR Part 51 gives state and local agencies the authority to establish air quality rules and regulations. Rules adopted by the local air pollution control districts and accepted by the Air Resources Board are included in the State Implementation Plan. When approved by the U.S. Environmental Protection Agency, these rules become federally enforceable.
Porter-Cologne Water Quality Control Act	Protects all waters of the state for the use and enjoyment of the people of California and declares that the protection of water resources be administered by the regional water quality control boards.
California Integrated Waste Management Act of 1989, California Assembly Bill AB 939	Provides for the proper management and disposal of solid wastes, to include the diversion requirements for construction and demolition debris.

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Chapter 2. Description of the Proposed Action and Alternatives

This chapter describes the Proposed Action (Alternative A), and the No-Action Alternative (Alternative B), for the WR IMP. The chapter includes detailed descriptions of equipment needs, construction requirements, and operational parameters for the Proposed Action.

2.1 Proposed Action (Alternative A)

The Proposed Action would occur at VAFB and PPAFS, and consists of the installation and operation of new telemetry (TM) and CT sites. Construction of these systems include installation of antennas and antenna domes (hereafter refer to as radomes); upgrade of supporting facilities to meet the needs of these modernizations to instrumentation and equipment; and decommission and removal of existing antennas and other components. Details of construction associated actions that would occur at each of these locations are described in detail in the following sections.

The type of construction equipment that would be used for implementing the Proposed Action is presented in Table 2.1. The exact type of equipment that would be used may vary slightly from these projections; however, these estimates provide a basis for analyzing related issues, such as air quality, noise, and traffic. A summary of total soil excavation, vegetation removal, and concrete and asphalt debris anticipated is presented in Table 2.2.

All facility improvements, modifications, or demolitions shall be coordinated with the 30 SW Civil Engineer Squadron (30 CES) through an approved AF Form 332, *Base Civil Engineer Work Request*, prior to construction.

During the operational phase of the Proposed Action, antennas would be active during launches from VAFB. Each antenna would

Table 2.1: Construction equipment usage for the Proposed Action.

Description	Qty	Usage	Description	Qty	Usage
VAFB – TM-B			***PPAFS – CT-4A, CT-4B, TM-B, and Modifications to AN/FPQ-6***		
Excavator	1	5 days	Excavator	1	15 days
Vibrator/Compactor	1	1 days	Vibrator/Compactor	1	3 days
Forklift	1	120 days	Forklift	1	320 days
Concrete Boom Pump with Drum Mixing Truck [(a)]	1	4 days	Concrete Boom Pump with Drum Mixing Truck [(a)]	1	9 days
Concrete Saw	1	1 days	Concrete Saw	1	2 days
Tandem Vibratory Smooth Drum Roller	1	1 days	Tandem Vibratory Smooth Drum Roller	1	3 days
40 Ton Crane	1	14 days	40 Ton Crane	1	42 days
Backhoe/Trencher/Dozer	1	5 days	Backhoe/Trencher/Dozer	1	10 days
Generator	1	3 days	Generator	1	5 days
Asphalt Roller	1	2 days	Asphalt Roller	1	3 days
Dump Truck	1	2 days	Dump Truck	1	3 days
Water Truck	1	2 days	Water Truck	1	2 days
Foreman Truck	1	120 days	Foreman Truck	1	240 days
Crew Pick-up Truck	2	120 days	Crew Pick-up Truck	2	240 days

Table 2.2. Summary of estimated total soil excavation, vegetation removal, and concrete and asphalt debris generated under the Proposed Action*.

	TM-B (Oak Mountain VAFB)	*TOTAL VAFB*	CT-4A & CT-4B (PPAFS)	TM-B (PPAFS)	AN/FPQ-6 (PPAFS)	*TOTAL (PPAFS)*
	ATTAS Replacement					
Asphalt & concrete debris (ft^3)	900	***900***	2,300	8,200	171	***10,671***
Soil excavated (ft^3)	26,700	***26,700***	19,138	24,080	5,500	***48,718***
Vegetation removal (ft^2)	50	***50***	1,200	85	100	***1,385***
	GRK-7 Replacement					
Asphalt & concrete debris (ft^3)	5,890	***5,890***	2,300	8,200	171	***10,671***
Soil excavated (ft^3)	26,638	***26,638***	19,138	24,080	5,500	***48,718***
Vegetation removal (ft^2)	10	***10***	1,200	85	100	***1,385***

* This table includes the different estimates for the option of demolishing and removing the ATTAS antenna to install the TM-B (top portion) and for the option of demolishing and removing the GRK-7 antenna to install the TM-B (bottom portion). Estimates for all other actions are the same in both options.

be active for approximately 8 hours, with an additional 6 hours for extended operations. Two to four personnel would be present at each facility during launches. At the present time, approximately 15 launches per year are planned.

2.1.1 Proposed Action at VAFB: TM-B at Oak Mountain

One system component is proposed on south VAFB: a new telemetry antenna (TM-B) at the Telemetry Receiving Station on Oak Mountain. The Telemetry Receiving Station at Oak Mountain on south VAFB currently has three antennas (ATTAS, GRK-7, and an 8-foot receiving antenna). The Proposed Action would replace the ATTAS antenna with the new TM-B (Figure 2.1). As a back-up option, the GRK-7 could also be replaced with the new TM-B, but this option is not as desirable. For purposes of this EA, both options are described. However, only one of these two antennas (the ATTAS or the GRK-7) will be demolished and replaced under the Proposed Action.

Construction of TM-B

TM-B is designed to be 44 ft in diameter, with a 64-foot diameter radome for weather protection, and aircraft warning lights installed on top of the radome (Figure 2.2). The antenna support structure would require a new foundation, ringwall, and radome assembly.

Overall, the new TM-B with support structures would be approximately 76 ft tall. A concrete foundation 50 ft in diameter and 3 ft thick would be installed to support the new antenna. An area approximately 2,827 square feet (ft^2) and 8 ft deep would be excavated to install the concrete foundation. Total soil excavated for this activity is estimated at 22,600 cubic feet (ft^3).

Antenna Decommission and Demolition

ATTAS Antenna

The existing ATTAS antenna and service tower (approximately 85 ft tall including pedestal) would be decommissioned, demolished, and disposed off site. Lead-based paint (LBP), asbestos and other hazardous materials would be removed by a state certified agent. Approximately 900 ft^3 of asphalt and concrete demolition debris would be generated as a result of the demolition of this antenna. The VAFB Sanitary Landfill (VAFB Landfill) would accept and recycle, if feasible, asphalt and concrete debris resulting from this demolition. Salvageable items

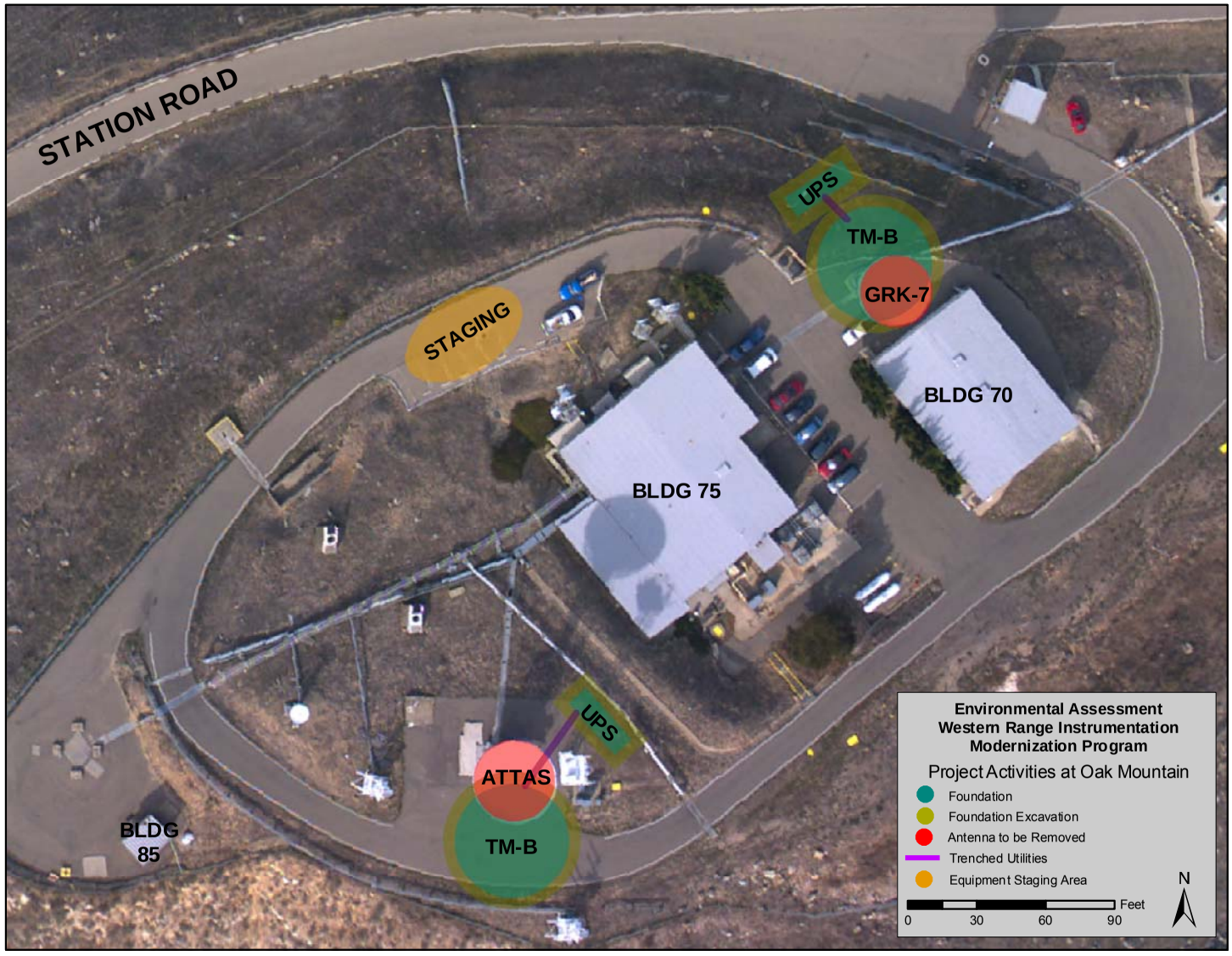

Figure 2.1: Modernization of the Telemetry Receiving Station at Oak Mountain on south VAFB under the Proposed Action (Alternative A).

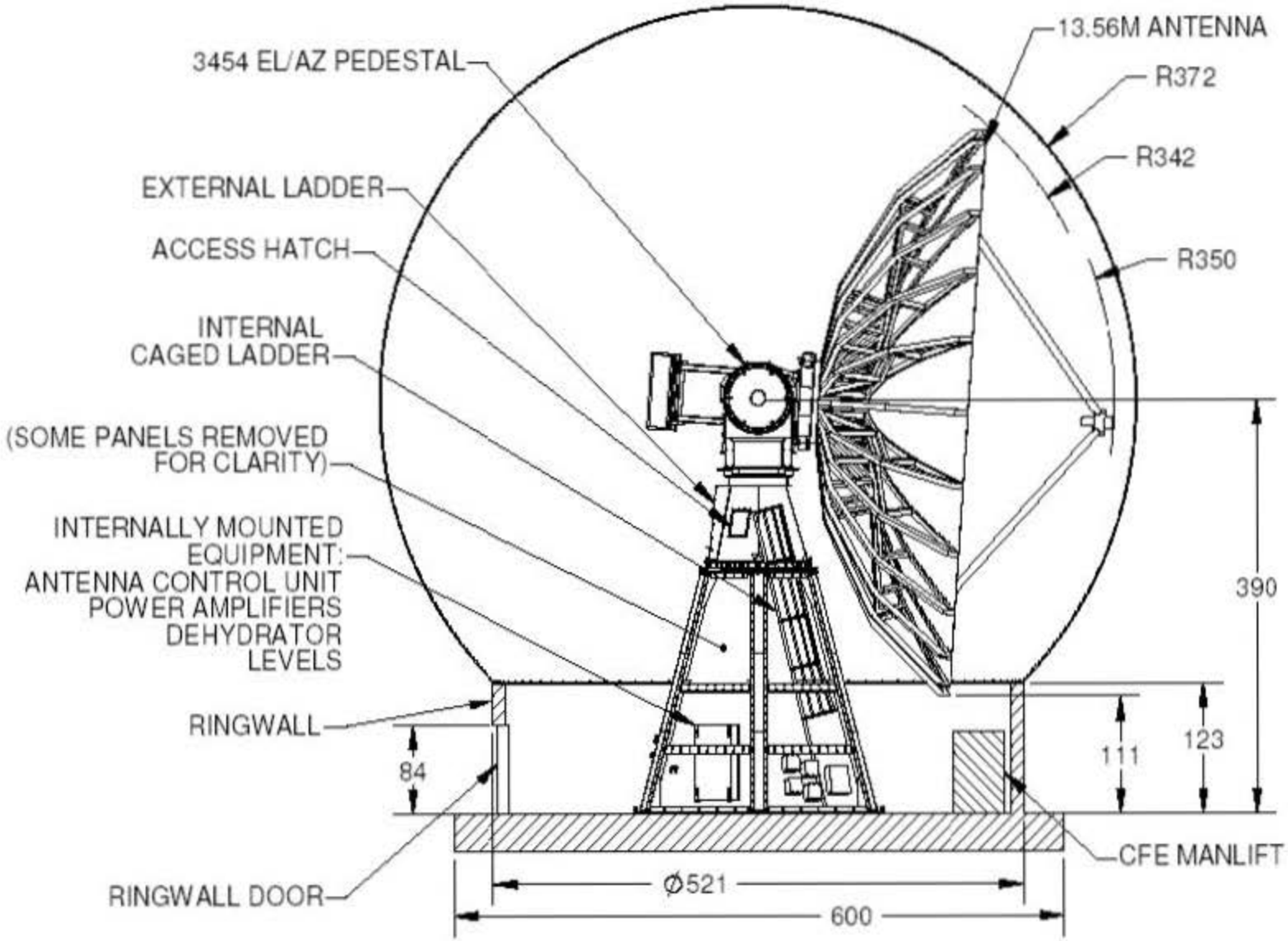

Figure 2.2. TM antenna concept with ringwall/radome assembly (measurements are in inches unless otherwise noted).

would be separated and sent to the VAFB Defense Reutilization and Marketing Office (DRMO).

GRK-7 Antenna

The GRK-7 antenna and service tower (approximately 80 ft tall including pedestal) would be decommissioned, demolished, and disposed off site. LBP, asbestos and other hazardous materials would be removed by a state certified agent. Approximately 5,890 ft^3 of asphalt and concrete demolition debris would be generated as a result of the demolition of this antenna. The VAFB Landfill would accept and recycle, if feasible, asphalt and concrete debris resulting from this demolition. Salvageable items would be separated and sent to the VAFB DRMO.

UPS Building

ATTAS Antenna Site

A 10-foot high, 300 ft^2 concrete masonry units (CMU) blocks building would be constructed adjacent to TM-B to house a new UPS unit. An area approximately 800 ft^2 and 5 ft deep would be excavated to install the 10 ft by 30 ft by 8-inch concrete foundation for this building. Total soil excavated is estimated at 4,000 ft^3.

GRK-7 Antenna Site

A 10-foot high, 300 ft^2 CMU blocks building would be constructed adjacent to TM-B to house a new UPS unit. An area approximately 800 ft^2 and 5 ft deep would be excavated to install the 10 ft by 30 ft by 8-inch concrete foundation for this building. Total soil excavated is estimated at 4,000 ft^3.

Utilities to TM-B

ATTAS Antenna Site

Trenched underground utilities would connect the UPS unit and TM-B. The trench would be 2.5 ft wide 1.5 ft deep and approximately 35 ft long. Vegetation removal to trench the utilities would be minimal (less than 50 ft^2). Approximately 100 ft^3 of soil would be excavated. Soil excavated during trenching would be backfilled.

New console electronics in Building 75 would provide support to the new TM-B. Existing underground utilities would provide communications and electrical support.

GRK-7 Antenna Site

The utilities trench connecting TM-B and the UPS building would be 2.5 ft wide, 1.5 ft deep and approximately 10 ft long, resulting in 37.5 ft^3 of excavated soil. The excavated soil would be used as backfill. Vegetation removal would be minimal (less than 10 ft^2).

New console electronics in Building 75 would provide support to the new TM-B. Existing underground utilities would provide communications and electrical support.

The construction contractor would dispose of all excess soil excavated at a pre-designated off-site disposal location (Nipomo Transfer Station, approximately 45 miles from VAFB). Three trips are estimated to be required to dispose all asphalt, concrete, excess soil, and other debris.

Construction equipment access to work sites would occur through established roads. The construction staging area would be located in the parking area northwest of Building 75 (Figure 2.1).

Construction activities at Oak Mountain for installation of the new TM-B would start in January 2009 and last approximately 6 months. Four workers with 8-hour workdays and 5-day workweeks would be required to complete this component of the project.

2.1.2 Proposed Action at PPAFS

Three system component upgrades are proposed on PPAFS: 1) two new ground mount command antennas with radome assembly (CT-4A and CT-4B), 2) one new telemetry antenna (TM-B) with radome assembly (TM-B), and 3) potential modifications to the AN/FPQ-6 radar.

2.1.2.1 New CT-4A and CT-4B

The CT antenna CT-4 is located at PPAFS. The Proposed Action would dismantle and

remove CT-4 and install two new ground mount CT antennas (CT-4A and CT-4B) southwest of Building 1 (Figure 2.3).

Construction of CT-4A and CT-4B

Each CT antenna would be approximately 31 ft tall, including the radome (Figure 2.4). Each antenna support structure will require a new foundation, ringwall, and radome assembly. Aircraft warning lights would be installed on top of each of the antenna radomes. Equipment to be installed for each antenna includes a RF transmitter, a heat exchanger, an evaporator, and a condensing unit.

Concrete foundations, 26 ft in diameter and 3 ft thick, would support each of the new CT antennas. An area approximately 1,017 ft^2 and 8 ft deep would be excavated to install the concrete foundation at each of the new CT sites. Total soil excavated at each CT site would be approximately 8,150 ft^3 (16,300 ft^3 for both CT sites).

CT-4 Decommission and Demolition

The concrete footer of the existing CT-4 would be demolished and removed, generating approximately 1,600 ft^3 of concrete debris. Salvageable materials would be transported to VAFB DRMO. All remaining debris would be sorted for recycling, if feasible, and taken to the local landfill (Ox Mountain Sanitary Landfill).

UPS Unit and Support Equipment

A new console, transformers and UPS units are required to support the new command antennas. This equipment is proposed to be housed in the second floor of Building 1.

Use of Building 1 for support of CT-4A and CT-4B would require a retrofit of the facility to be in compliance with the International Building Code (Schott and Associates 2007). Although final seismic retrofit actions have not been identified, Schott and Associates (2007) recommends the following actions:

- Install a 5-inch thick layer of shotcrete over the exterior of the North, West and South walls and an 8-inch thick layer over the entire East wall. Installation of the shotcrete would require the installation of rebar dowels and keyways chipped into the existing stemwall, masonry walls, columns, floor slab, and roof.
- Install a concrete fill-in panel above the second floor of the East wall, at its northern end.

  There is a 4-inch step up from the east end entry/stair section of the building to the main floor level at both the first and second floors. To satisfy access/stair riser requirements, a 7-inch concrete fill would be poured in the area between the two easterly walls with ramps down to the first and second floor slab and to the exterior grade. Remove and replace existing hollow metal doors and frames to match new floor heights.
- Paint the new exterior elevations using an elastomeric-type coating.
- The existing concrete Tower near the northwest comer is isolated from the main building (2 inches all around) at all three levels with a separate pad footing. This 2-inch gap would be blocked-up solid so that the building and tower move in unison during a seismic event.

Because final actions required for the retrofit are not available at this time, this EA cannot address the potential environmental effects associated with this aspect of the Proposed Action. Therefore, additional environmental review and analysis would be required at the time seismic retrofit activities are decided and designs are generated.

Utilities

Power lines would be trenched from Building 8 to Building 1, to each command antenna. Communication lines would be trenched from Building 13 to Building 1, to

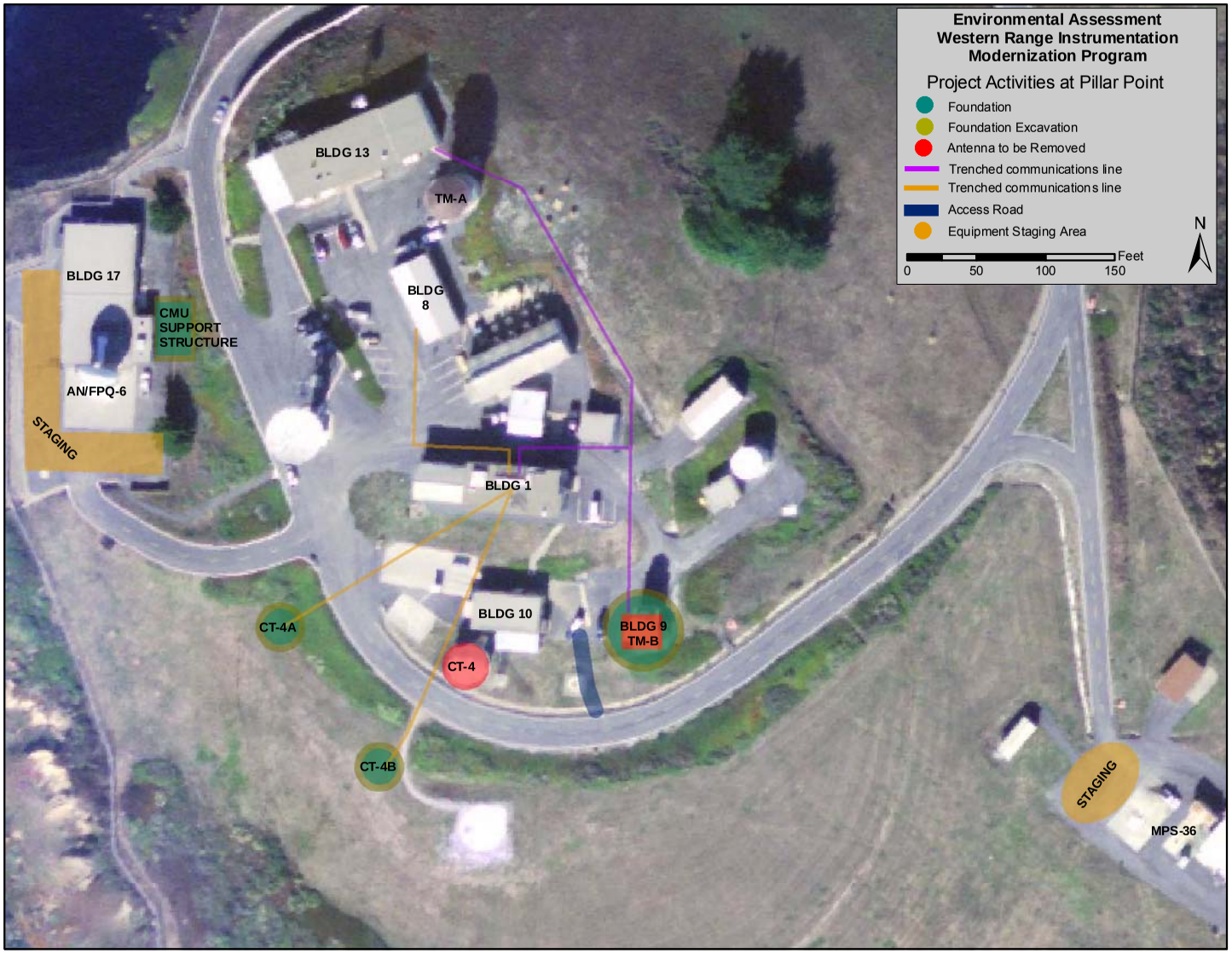

Figure 2.3. Modernization of CT-4 and Telemetry Receiving Station at PPAFS under the Proposed Action (Alternative A).

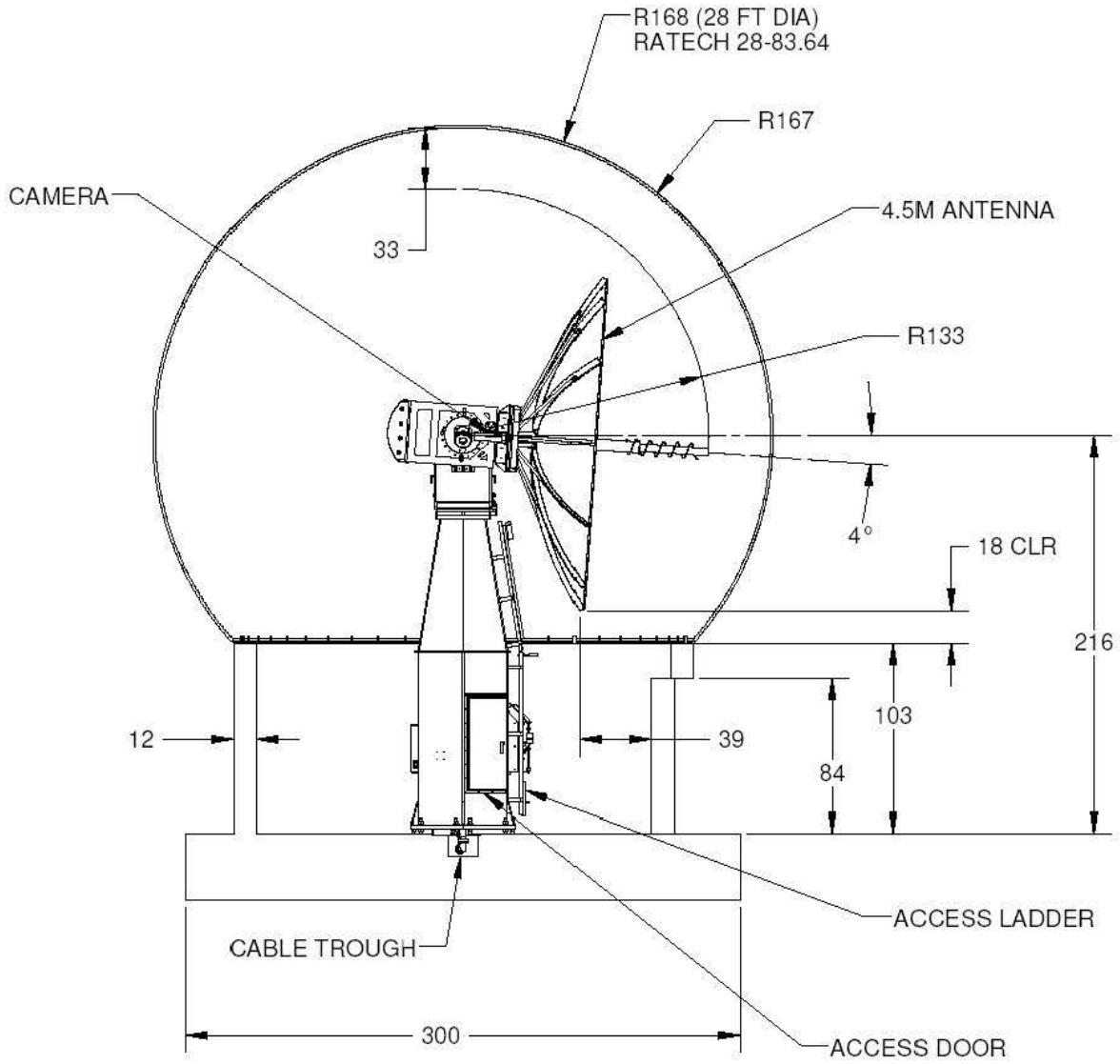

Figure 2.4. CT antenna concept with ringwall/radome assembly (measurements are in inches unless otherwise noted).

each command antenna. Trenches would be 2.5 ft wide and 1.5 ft deep and total approximately 574 ft for electrical and 372 ft for communications. The trenches would be placed across asphalt and vegetated areas, generating 700 ft^3 of asphalt debris, and requiring the removal of 1,222 ft^2 of vegetation. A total of 2,838 ft^3 of soil would be excavated. Soil excavated during trenching would be backfilled.

The construction contractor would dispose of all asphalt debris and any excess soil excavated at a pre-designated off-site disposal location (Ox Mountain Sanitary landfill, approximately 10 miles from PPAFS). Three trips are estimated to be required to dispose all asphalt, concrete, excess soil, and other debris generated.

Construction activities at PPAFS for installation of the new CT-4A and CT-4B would start in fall 2008 and last approximately 6 months. Four workers with 8-hour workdays and 5-day workweeks would be required to complete this component of the project.

2.1.2.2 New TM-B

Under the Proposed Action the Telemetry Receiving Station at PPAFS would be upgraded with a new telemetry antenna with radome assembly (TM-B; Figure 2.3).

Construction of TM-B

TM-B would be a 44-foot diameter dish antenna approximately 76 ft tall including radome and ringwall (Figure 2.2). The antenna support structure will require a new foundation, riser/ringwall, and radome assembly. Aircraft warning lights would be installed on top of the new antenna radome.

A concrete foundation 50 ft in diameter and 3 ft thick would support TM-B. An area approximately 2,825 ft^2 and 8 ft deep would be excavated to install the concrete foundation. Total soil excavated would be approximately 22,600 ft^3.

Demolition of Building 9

As part of this upgrade, Building 9 would be demolished and disposed off site to place TM-B at this location. All LBP, asbestos, and other hazardous materials shall be removed by a state certified agent. A total of 7,250 ft^3 of demolition debris (including concrete, CMU block, steel, wood, glass, fiberglass, and electrical components) and 700 ft^3 of asphalt debris are anticipated. Salvageable materials would be transported to VAFB DRMO. All remaining debris would be sorted for recycling if feasible, and taken to the local landfill (Ox Mountain Sanitary Landfill), approximately 10 miles from PPAFS.

Service Road

A 20 ft wide and 78 ft long paved asphalt service road will be constructed from the existing asphalt road to the new TM-B. Approximately 6 to 8 inches of soil would be excavated to prepare for the road, resulting in an estimated maximum 1,040 ft^3 of excavated soil.

Utilities

Building 13 has been designated to support TM-B (and the already constructed TM-A). A communications line would be trenched from TM-B to the communications trench for CT-4A and CT-4B, which connects to Building 13. This trench would be 2.5 ft wide, 1.5 ft deep, and approximately 117 ft long, and placed across asphalt and vegetated areas. Asphalt would be saw cut as required, generating approximately 250 ft^3 of asphalt debris. Approximately 85 ft^2 of vegetation would also be removed. A total of 440 ft^3 of soil would be excavated. Excavated soil would be used as backfill material.

The contractor would dispose of all asphalt debris and excess soil excavated at a pre-designated off-site disposal location (Ox Mountain Sanitary Landfill, approximately 10 miles from PPAFS). Four trips are estimated to be required to dispose all asphalt, concrete, excess soil, and other debris.

Construction equipment access to work sites would occur through the existing paved road and the path that has been pre-established for the new service road. The construction staging area would be sited at the unused MPS-36 location (Figure 2.3).

Construction activities at PPAFS for installation of TM-B would begin in January 2010 and last approximately 6 months. Four workers with 8-hour workdays and 5-day workweeks would be required to complete this component of the project.

2.1.2.3 Modification of AN/FPQ-6 Radar Tracking System

Construction of a CMU block structure at the east side of Building 17 to support the AN/FPQ-6 fixed, land-based radar tracking system at PPAFS, is also being considered (Figure 2.3). The decision of implementing this aspect of the Proposed Action is dependent upon a final decision by the Air Force to reduce the number of unnecessarily redundant systems. Additional environmental review and actions would be required if this aspect of the Proposed Action is implemented, due to potential for below ground contamination (dielectric oil contaminated with polychlorinated biphenyls [PCBs] and other unknown contaminants). Coordination with 30 CES/CEV Installation Restoration Program Office would be required, and additional environmental review may also be required.

The CMU structure would be approximately 500 ft^2 with a height of 12 ft and contain two chiller units. The concrete foundation for this addition would be approximately 700 ft^2. A 250 ft^2 concrete pad adjacent to the CMU structure would also be installed to support a 2,000-gallon oil storage tank. Asphalt and concrete would be saw cut and removed as required, generating approximately 171 ft^3 of debris. Vegetation removal is estimated at 100 ft^2. Total soil excavation anticipated to install these foundations is 5,500 ft^3.

The existing fire sprinkler system, and smoke, and fire detection units in Building 17 would be extended to provide protection for the new structure. Connection between Building 17 and the CMU would occur through trenched underground utilities. The trench would be 2.5 ft wide, 1.5 ft deep and 10 ft long. Approximately 40 ft^3 of soil would be excavated. The trench would be located east of Building 17, under the new CMU structure. Soil would be used as backfill material.

The construction contractor would dispose of all excess soil excavated at a pre-designated off-site disposal location (Ox Mountain Sanitary landfill, approximately 10 miles from PPAFS). Two trips are estimated to be required to dispose all asphalt, concrete, excess soil, and other debris generated.

Construction equipment access to work sites would occur through the existing paved road. The staging area for construction activities would be sited at the unused AN/FPQ-6 parking area (Figure 2.3).

Construction activities at PPAFS to support the AN/FPQ-6 radar tracking system would begin in January 2009 and last approximately 4 months. Four workers with 8-hour workdays and 5-day workweeks would be required to complete this component of the project.

2.2 Alternative B: No-Action Alternative

Under the No-Action Alternative, instrumentation supporting the WR would not be upgraded. New CT and telemetry antennas would not be installed and supporting facilities would not be upgraded, resulting in no effects on the natural and human environments. However, the No-Action Alternative would place all future space launch missions and payloads at risk as the antiquated system currently in place continues to age and become inefficient and unreliable. Additionally, maintenance costs would continue to increase as parts become more difficult to obtain for these obsolete systems.

Chapter 3. Affected Environment

3.1 Air Quality

Air quality is defined by ambient air concentrations of specific pollutants determined by the U.S. Environmental Protection Agency (EPA) to be of concern with respect to the health and welfare of the general public. Seven major pollutants of concern, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). The U.S. EPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as non-attainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air [$\mu g/m^3$]) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, lead, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, PM_{10} and $PM_{2.5}$ can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered "precursors" to secondary pollutants in the atmosphere (such as reactive organic gases (ROG) and oxides of nitrogen (NOx), which are considered precursors for O_3), are the pollutants for which emissions are evaluated to control the level of O_3 in the ambient air.

The State of California has identified four additional pollutants for ambient air quality standards: visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Air Resources Board (CARB) has also established the more stringent California Ambient Air Quality Standards (CAAQS). Areas within California in which ambient air concentrations of a pollutant are higher than the state and/or federal standard are considered to be non-attainment for that pollutant. Table 3.1 shows both the federal and state ambient air quality standards.

Toxic air pollutants, also called hazardous air pollutants, are a class of pollutants that do not

Table 3.1. Ambient air quality standards.

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	-	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.08 ppm		0.070 ppm (137 µg/m^3)[note 7]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 µg/m^3)	None	9.0 ppm (10 µg/m^3)
	1-Hour	35 ppm (40 µg/m^3)		20 ppm (23 µg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary Standard	0.030 ppm (56 µg/m^3)
	1-Hour	-		0.18 ppm (338 µg/m^3)
Sulfur Dioxide (SO_2)	Annual Average	80 µg/m^3 (0.03 ppm)	-	-
	24-Hour	365 µg/m^3 (0.14 ppm)	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	1300 µg/m^3 (0.5 ppm)	-
	1-Hour	-	-	0.25 ppm (655 µg/m^3)
Suspended Particulate Matter (PM_{10})	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	-		20 µg/m^3 [note 8]
Fine Particulate Matter ($PM_{2.5}$)[6]	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3 [note 8]
Lead (Pb)[9]	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[9]	24 Hour			0.01 ppm (26 µg/m^3)

1 - NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current federal policies.

2 - California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

3 - National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

4 - National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

5 - Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

6 - New federal 8-hour ozone and fine particulate matter standards were promulgated by USEPA on 18 July 1997. The federal 1-hour O_3 standard continues to apply in areas that violated the standard. On 15 April 2004 the U.S. EPA issued attainment designations for the 8-hour standard and described plans for the phase out of the 1-hour standard (U.S. EPA 2004a).

7 - Approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.

8 - On 5 June 2003, the Office of Administrative Law approved the amendments to the regulations for the state ambient air quality standards for particulate matter and sulfates. Those amendments established a new annual average standard for $PM_{2.5}$ of 12 µg/m^3 and reduced the level of the annual average standard for PM_{10} to 20 µg/m^3. The approved amendments were filed with the Secretary of State on 5 June 2003. The regulations became effective on 5 July 2003.

9 - The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

µg/m^3 = micrograms per cubic meter

SOURCE: CARB 2007a, U.S. EPA 2005.

have ambient air quality standards but are examined on an individual basis when there is a source of these pollutants. The State of California has identified particulate emissions from diesel engines as a toxic air pollutant.

3.1.1 Regional Setting

3.1.1.1 VAFB

VAFB is within Santa Barbara County and under the jurisdiction of the SBCAPCD. The SBCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies in Santa Barbara County, which is within the South Central Coast Air Basin (SCCAB). The SCCAB includes San Luis Obispo, Santa Barbara, and Ventura Counties.

The SCCAB, and all of Southern California, lies in a semi-permanent high-pressure zone of Eastern Pacific Region. The coastal island is characterized by sparse rainfall, most of which occurs in the winter season and hot, dry summers, tempered by cooling sea breezes. In Santa Barbara County, the months of heaviest precipitation are November through April, averaging 14.66 inches annually. The mean temperature in the VAFB area, as reported by monitors in Lompoc, is 58.4 degrees Farenheit (°F) and the mean maximum and mean minimum temperatures are 69.8 °F and 47.1 °F, respectively (Western Regional Climatic Center [WRCC] 2007).

Santa Barbara County is classified as an attainment/unclassified area for the NAAQS for all criteria pollutants. Santa Barbara County is considered a nonattainment area for the CAAQS for ozone and PM_{10}. Santa Barbara County is classified as an attainment/unclassified area for the CAAQS for all other criteria pollutants.

The CARB and SBCAPCD operate a network of ambient air monitoring stations throughout Santa Barbara County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the project site is the VAFB station, which measures all criteria pollutants except $PM_{2.5}$. The only monitoring stations within Santa Barbara County that monitor $PM_{2.5}$ are located on Broadway in Santa Barbara, and at 700 East Canon Perdido. Ambient concentrations of pollutants over the last 3 years are presented in Table 3.2.

The 1-hour CAAQS for ozone was not exceeded at the VAFB monitoring station during the period from 2004 through 2006. The federal 8-hour ozone standard was not exceeded at the VAFB monitoring station during the period from 2004 through 2006. The federal PM_{10} standards were not exceeded at the VAFB monitoring station during the period from 2004 through 2006. The CAAQS for PM_{10} was exceeded once during that period. The data from the monitoring stations indicate that air quality is in attainment of all other state and federal standards.

3.1.1.2 PPAFS

PPAFS is within San Mateo County and under the jurisdiction of the BAAQMD. The BAAQMD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies in the Bay Area Air Basin (BAAB). The BAAB includes Santa Clara, San Mateo, Alameda, San Francisco, Contra Costa, Marin, and Napa Counties, and portions of Sonoma and Solano Counties.

The climate of San Mateo County is influenced by its proximity to the Pacific Ocean and cold currents offshore, and the local topographical conditions. The County includes the San Moreno range and the San Bruno hills, on the west and north respectively, and its climate is also influenced by the proximity of the waters of San Francisco Bay, which provide a warming influence.

Summer climatic conditions are generally warmer than other portions of the Pacific Coast region. Heat in the Sacramento and San Joaquin Valleys causes the colder air from the Pacific Ocean to rush in from the

Table 3.2. Background ambient air quality at VAFB (concentrations in ppm unless otherwise indicated).

Pollutant	Averaging Time	2004	2005	2006	CAAQS (ppm)	NAAQS (ppm)	Monitoring Station
Ozone	8 hour	0.083	0.066	0.063	0.070	0.08	VAFB
	1 hour	0.092	0.072	0.070	0.09	-	VAFB
PM_{10}[2]	Annual Arithmetic Mean	18.5 µg/m^3	15.7 µg/m^3	18.3 µg/m^3	20 µg/m^3	-	VAFB
	24 hour	38.1 µg/m^3	41.8 µg/m^3	55.3 µg/m^3	50 µg/m^3	150 µg/m^3	VAFB
$PM_{2.5}$	Annual Arithmetic Mean	11.0 µg/m^3	10.6 µg/m^3	10.1 µg/m^3	12 µg/m^3	15 µg/m^3	Canon Perdido
	24 hour	28 µg/m^3	28 µg/m^3	28 µg/m^3	-	35 µg/m^3	Canon Perdido
NO_2	Annual	0.001	0.001	0.001	0.030	0.053	VAFB
	1 hour	0.023	0.019	0.016	0.18	-	VAFB
CO	8 hour	0.36	0.70	0.28	9.0	9	VAFB
	1 hour	0.3	0.9	0.3	20	35	VAFB
SO_2	Annual	0.000	0.000	0.000	-	0.030	VAFB
	24 hour	0.002	0.001	0.001	0.04	0.14	VAFB
	3 hour	0.003	0.003	0.005	-	0.5	VAFB
	1 hour	0.009	0.004	0.007	0.25	-	VAFB

1 - Secondary NAAQS
2 – California averages reported for PM_{10}
N/A = not available from current website data
SOURCE: www.arb.ca.gov (all pollutants except 1-hour CO and 1-hour and 3-hour SO_2 and annual data for 2005)
www.epa.gov/air/data/monvals.html (1-hour CO and 1-hour and 3-hour SO_2 and annual data for 2005)

coast. Because of the break in the coast mountains at the Golden Gate, air currents are prevailingly easterly winds and are intensified by the formation of the Gate. They are then deflected down the peninsula as north winds by the obstructions in the bay, consisting of the Contra Costa and Alameda shores, the Berkeley Hills, Angel Island, Yerba Buena and Alcatraz, the Sausalito Hills, Mount Tamalpais, and the hills of San Francisco. In winter there is a reversal to normal of general climatic conditions when the prevailing winds are from the southeast and southwest.

In San Mateo County, the months of heaviest precipitation are November through April, averaging 26.88 inches annually. The mean temperature in the PPAFS area, as reported by monitors in Half Moon Bay, is 54.7 °F, and the mean maximum and mean minimum temperatures are 62.2 °F and 47.2 °F, respectively (WRCC 2007).

San Mateo County is classified as a marginal nonattainment area for the 8-hour ozone NAAQS, and an unclassified/attainment area for all other criteria pollutants. San Mateo County is considered a nonattainment area for the CAAQS for ozone, $PM_{2.5}$, and PM_{10}. San Mateo County is classified as an attainment/unclassified area for the CAAQS for all other criteria pollutants.

The CARB and BAAQMD operate a network of ambient air monitoring stations throughout the Bay Area. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring station to the project site is the Redwood City station, which measures all criteria pollutants except SO_2. Ambient concentrations of pollutants over the last 3 years are presented in Table 3.3.

Table 3.3. Background ambient air quality at PPAFS (concentrations in ppm unless otherwise indicated).

Pollutant	Averaging Time	2004	2005	2006	CAAQS (ppm)	NAAQS (ppm)	Monitoring Station
Ozone	8 hour	0.071	0.061	0.063	0.070	0.08	Redwood City
	1 hour	0.097	0.084	0.085	0.09	-	Redwood City
PM_{10}[2]	Annual Arithmetic Mean	20 µg/m^3	20 µg/m^3	19 µg/m^3	20 µg/m^3	-	Redwood City
	24 hour	62 µg/m^3	78 µg/m^3	66 µg/m^3	50 µg/m^3	150 µg/m^3	Redwood City
$PM_{2.5}$	Annual Arithmetic Mean	9.3 µg/m^3	8.8 µg/m^3	9.6 µg/m^3	12 µg/m^3	15 µg/m^3	Redwood City
	24 hour	36 µg/m^3	31 µg/m^3	75 µg/m^3	-	35 µg/m^3	Redwood City
NO_2	Annual	0.015	0.015	0.014	0.030	0.053	Redwood City
	1 hour	0.061	0.062	0.069	0.18	-	Redwood City
CO	8 hour	2.1	2.3	2.4	9.0	9	Redwood City
	1 hour	4.8	4.5	5.5	20	35	Redwood City

1 – Secondary NAAQS
2 – California averages reported for PM_{10}
N/A = not available from current website data
SOURCE: www.arb.ca.gov (all pollutants except 1-hour CO and 1-hour and 3-hour SO_2 and annual data for 2005)
www.epa.gov/air/data/monvals.html (1-hour CO and 1-hour and 3-hour SO_2 and annual data for 2005)

The 1-hour CAAQS for ozone was exceeded once at the Redwood City monitoring station during the period from 2004 through 2006. The federal 8-hour ozone standard was not exceeded at the Redwood City monitoring station during the period from 2004 through 2006. The federal PM_{10} standards were not exceeded at the Redwood City monitoring station during the period from 2004 through 2006; however, the federal 24-hour $PM_{2.5}$ standard was exceeded once in 2006. The monitoring station measured exceedances of the CAAQS for $PM_{2.5}$ and PM_{10} during that period. The data from the monitoring stations indicate that air quality is in attainment of all other state and federal standards.

3.1.1.3 Region of Influence

Specifically identifying the region of influence (ROI) for air quality requires knowledge of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to a few miles downwind from the source. However, for photochemical pollutant such as ozone, the ROI may extend much farther downwind. Ozone is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (ROG, NO_X, and PM_{10}). The maximum effect of precursors on ozone levels tends to occur several hours after the time of emission during periods of high solar load and may occur many miles from the source. Ozone and ozone precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. The ROI for the WR IMP includes the SCCAB for activities at VAFB and the BAAB for activities at PPAFS.

3.1.2 Federal Requirements

Clean Air Act, General Conformity, and NEPA

The U.S. EPA is the agency responsible for enforcing the Clean Air Act (CAA) of 1970 and its 1977 and 1990 amendments. The purpose of the CAA is to establish NAAQS, to classify areas as to their attainment status

relative to the NAAQS, to develop schedules and strategies to meet the NAAQS, and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The CAA Amendments of 1990 established new deadlines for achievement of the NAAQS, dependent upon the severity of non-attainment.

The U.S. EPA requires each state to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with the NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each change to a compliance schedule or plan must be incorporated into the SIP. In California, the SIP consists of separate elements for each air basin, depending on the attainment status of that air basin.

The CAA Amendments also require that states develop an operating permit program that would require permits for all major sources of pollutants. The program would be designed to reduce mobile source emissions and control emissions of hazardous air pollutants through establishing control technology guidelines for various classes of emission sources.

New Source Review. A New Source Review (NSR) is required when a source has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specified major source thresholds (100 or 250 tons per year [tons/yr]) which are predicated on a source's industrial category. A major modification to the source also triggers an NSR. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any pollutant regulated under the CAA. Any new or modified stationary emission sources require permits from the SBCAPCD and the BAAQMD to construct and operate. Through the SBCAPCD's and BAAQMD's permitting processes, all stationary sources are reviewed and are subject to an NSR process. The NSR process ensures that factors such as the availability of emission offsets and their ability to reduce emissions are addressed.

Executive Order 12088. EO 12088 requires the head of each federal agency to comply with "applicable pollution control standards" defined as "the same substantive, procedural, and other requirements that would apply to a private person." The EO further requires federal agencies to cooperate with the U.S. EPA, state, and local environmental regulatory officials. To ensure their cost-effective and timely compliance with applicable pollution control standards, the U.S. EPA Administrator is required to provide technical advice and assistance to executive agencies. EO 12088 also provides that disputes between the U.S. EPA and other federal agencies, regarding environmental violations, shall be elevated to the Office of Management and Budget for resolution. EO 13148 revoked Section 1-4, *Pollution Control Plan*, of EO 12088.

Executive Order 13148. This EO was issued to ensure that all necessary actions are taken to integrate environmental accountability in agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Pollution prevention (P2) is highlighted as a key aspect to the environmental management system process. The head of each federal agency is responsible for ensuring that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Consequently, environmental management considerations must be a fundamental and integral component of federal government policies, operations, planning, and management. The head of each federal agency is responsible for meeting the goals and requirements of this order. Examples of environmental

requirements include air, water, wastewater, or hazardous waste permits.

Executive Order 13423. On January 24, 2007, President Bush issued EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*. One of the main requirements established under this EO is the reduction of greenhouse gases through a reduction in energy intensity of 3 percent per year or 30 percent by the end of fiscal year 2015.

General Conformity. Under 40 CFR Part 93 and the provisions of Part 51, Subchapter C., Chapter I, Title 40, Appendix W of the CFR for the CAA as Amended, federal agencies are required to demonstrate that federal actions conform with the applicable SIP. To ensure that federal activities do not hamper local efforts to control air pollution, Section 176I of the CAA, 42 U.S.C. 7506I, prohibits federal agencies, departments, or instrumentalities from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any action which does not conform to an approved state or federal implementation plan. The provisions of Part 51, Subchapter C, Chapter I, Title 40, of the CFR, entered into effect December 27, 1993.

The U.S. EPA general conformity rule applies to federal actions occurring in non-attainment or maintenance areas. Because Santa Barbara County is an unclassified/attainment area for all NAAQS, the General Conformity Rule does not apply to the proposed action at VAFB. The general conformity rule does apply to the Proposed Action activities within PPAFS. The relevant *de minimis* levels for operating areas/ranges in which Joint Task Force Exercise participants are located are shown in Table 3.4.

3.1.3 Local Requirements

As indicated previously, in Santa Barbara County, the SBCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. In San Mateo County, the BAAQMD is the agency responsible for administering air quality regulations. Included in the local air districts' tasks are monitoring of air pollution, maintenance of air quality standards through programs to control air pollutant emissions, and the promulgation of Rules and Regulations.

SBCAPCD and BAAQMD regulations require that facilities building, altering, or replacing stationary equipment that may emit air pollutants obtain an Authority to Construct permit. Further, SBCAPCD and BAAQMD regulations require stationary sources of air pollutants to obtain a Permit to Operate. The local air districts are responsible for the review of applications and for the approval and issuance of these permits. In addition, the SBCAPCD regulations require stationary source that would emit 25 tons/yr or more of any pollutant except CO in any calendar year during construction to obtain emission offsets. The BAAQMD does not have a similar regulation applying to construction activities; however, the BAAQMD requires implementation of fugitive dust control measures such as watering active construction sites a minimum of twice daily and utilization of best management practices to reduce dust.

Table 3.4. *De minimis* levels for PPAFS.

Installation	Air Basin	*De Minimis* Levels, tons/yr				
		CO	NO_x	ROG	PM_{10}	SO_x
Pillar Point Air Force Station	Bay Area	N/A	100	100	N/A	N/A

The SBCAPCD requires the submittal of a Notification for Renovation and Demolition, for demolition activities that would occur on VAFB. Likewise, the BAAQMD requires the submittal of a Demolition, Regulation 11, Rule 2, Notification Form, for demolition activities that would occur on PPAFS.

3.2 Biological Resources

Federal agencies are required by Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*), to assess the effect of any project on federally listed threatened and endangered species. Under Section 7, consultation with the USFWS and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries Service) is required for federal projects if such actions could directly or indirectly adversely affect listed species or destroy or adversely modify critical habitat.

It is also Air Force policy to consider listed and special status species recognized by state agencies when evaluating impacts of a project. Impacts to biological resources would occur if special status species (i.e., endangered, threatened, rare, or candidate) or their habitats, as designated by federal and state agencies, would be directly or indirectly adversely affected by project-related activities. Adverse effects can be short- or long-term, such as short-term impacts from noise and dust during construction, and long-term impacts from the loss of vegetation and, consequently, loss of habitat for wildlife.

Potential occurrence of plant and wildlife species was determined based on field surveys conducted for this project, on past documentation of special status species within the vicinity of the project area, and on the suitability of habitat and occurrence within the region of a particular species. The scope of the biological analysis includes vegetation and wildlife resources, as well as waters of the United States and wetlands.

3.2.1 Resources on VAFB

Biological resources on VAFB are abundant and diverse compared to other areas of California because VAFB is within an ecological transition zone where the northern and southern ranges of many species overlap, and because the majority of the land within the Base boundaries has remained undeveloped.

VAFB is located in a transitional ecological region that lies at the northern and southern distributional limits of many species, and contains diverse biological resources of considerable importance. The Base provides habitat for many federal and state listed threatened, endangered, and special concern plant and animal species. Fourteen major vegetation types have been described and mapped on VAFB (VAFB *In Progress 1*).

A literature search, general biological survey, and special status species survey (completed in late September 2007) were used to characterize the biological resources within the project areas for the Proposed Action. Potential occurrence of plant and wildlife species, including special status species was determined based on suitable habitat preferences and on known occurrence based on literature searches and other existing documentation. Sources used to determine potential occurrence include literature and maps of natural resources present at VAFB and existing local and regional references (VAFB *In Progress 1*; California Department of Fish and Game [CDFG] 1999, 2001, 2003, 2007a, 2007b, 2007c; Christopher 1996, 2002; Coulombe and Mahrdt 1976; Holmgren and Collins 1999; Keil and Holland 1998; Lehman 1994). Special status species survey and location maps (SRS Technologies [SRS] 2006, 2007, and ManTech SRS Technologies [MSRS] 2008) were superimposed over the study area and intersecting occupied habitat was documented and/or reviewed.

3.2.1.1 Vegetation Types and Wildlife Species

Vegetation within the project area at Oak Mountain consists predominantly of mowed non-native grassland dominated by non-

native annual grasses and forbs such as cutleaf plantain (*Plantago coronopus*). The soil appears locally shallow and rocky with numerous rocky outcrops in the vicinity. On steeply sloping hillsides where much of the surface soil has been removed by previous construction activities, long stem buckwheat (*Eriogonum elongatum*), is a dominant species. On well soiled, unmowed slopes, sawtooth goldenbush (*Hazardia squarrosa*), and Italian thistle (*Carduus pycnocephalus*) are common. Sweet fennel (*Foeniculum vulgare*) is also present in patches on some of these slopes where it forms dense monotypic stands.

Rufous-crowned sparrow (*Aimophila ruficeps*), a California Species of Concern, was the only special status species detected during field surveys. These birds were associated with rocky outcrops immediately adjacent to the project area.

The rocky grassland habitat within the project area provides habitat for reptiles such as the western fence lizard (*Sceloporus occidentalis*), San Diego gophersnake (*Pituophis catenifer annectens*), and southern pacific rattlesnake (*Crotalus helleri*). Lesser goldfinches (*Carduelis psaltria*), and house finches (*Carpodacus mexicanus*) were abundant on site during field surveys. These birds were observed feeding on Italian thistle seed heads on the slopes adjacent to the site. House finches also likely utilize the present antenna arrays for nesting. Golden eagles (*Aquila chrysaetos*) nest in the surrounding canyons and are likely to forage near the site. Mule deer (*Odocoileus hemionus*) were observed grazing adjacent to the site and there was evidence of extensive Botta's pocket gopher (*Thomomys bottae*) and California ground squirrel (*Spermophilus beecheyi*) activity within the unpaved portions of the project area.

3.2.1.2 Sensitive Vegetation Types and Special Status Species

No sensitive vegetation types or special status species are known to occur within the project area at Oak Mountain.

3.2.2 Resources at PPAFS

The biological significance of PPAFS lies in the fact that it is one of the few open, relatively undeveloped patches of ocean front land remaining along the Pacific Ocean side of the San Francisco Peninsula. Northern coastal scrub and coastal terrace that occupy parts of the peninsula are relatively rare in this area of coastal California. PPAFS is important to migrating land birds because it juts westward into the Pacific Ocean, where it can act as a migrant trap for birds that have strayed out over water. This headland is the nearest landfall along this stretch of coast for birds migrating over water and as such, tends to attract a variety of common and rare migrants (San Francisco Bay Bird Observatory 1993). PPAFS also provides important habitat for both resident and migratory birds.

A literature search, general biological survey, and special status species survey (completed in late September 2007) were used to characterize the biological resources within the project area for the Proposed Action. Potential occurrence of plant and wildlife species, including special status species was determined based on suitable habitat preferences and on known occurrence based on literature searches and other existing documentation. Sources used to determine potential occurrence include literature and maps of natural resources present at PPAFS and existing local and regional references (VAFB 2000, *In Progress 2*); CDFG 1994, 2007b, 2007c, 2003; Correlli 1993; Larsen and McGinnis 1993; Nature Conservancy 1993; Science Applications International Corporation [SAIC] 1994; Serpa 1993; VAFB 1999a, 1999b).

3.2.2.1 Vegetation Types and Wildlife Species

Equipment and upgrades to be installed and constructed at PPAFS would occur within paved areas and non-native grassland abutting highly fragmented north coast scrub remnants. Grasslands are dominated by non-native annual species such as bromes (*Bromus* spp.). Patches of iceplant

(*Carpobrotus* spp.) are also present adjacent to many of the existing facilities and roadways. Native species such as beach strawberry (*Fragaria chilensis*), bent grass (*Agoseris* spp.), and dune buckwheat (*Eriogonum latifolium*) are present within the non-native grassland. The patches of north coast scrub are dominated by coyote brush, with those on the southwest portion of the facility heavily infiltrated by iceplant. California aster (*Aster chilensis*), is also common within the scrub, and dune buckwheat is especially common at the interface of the scrub and grassland communities.

Grassland and scrub habitat within the project area provides habitat for common reptiles such as the western fence lizard. Non-native European starlings (*Sturnus vulgaris*) are common on the site as well as native species such as lesser goldfinch, and loggerhead shrike (*Lanius ludovicianus*). Because the site is situated on a point projecting into the ocean, sea birds including pelagic species are also common. Birds observed during the field survey of late September 2007 included California brown pelican (*Pelecanus occidentalis californicus*), a Pomarine jaeger (*Stercorarius pomarinus*), California gull (*Larus californicus*), Western gull (*Larus occidentalis*), and Heermann's gull (*Larus heermanni*).

3.2.2.2 Sensitive Vegetation Types and Special Status Species

No sensitive vegetation types or special status species occur within the project area at PPAFS. The federally endangered California brown pelican was documented near the project area for the Proposed Action during the September 2007 field surveys. These birds were observed flying over the point, along the coastline and perched on the rocks offshore. Occurrence on the facility is likely limited to overflights; thus, they would not be affected by the Proposed Action.

Loggerhead shrike, a federal Bird of Conservation Concern is a common species observed at PPAFS during the September 2007 field surveys. Past literature and reports on the wildlife species of PPAFS have not included this species as a breeder on the installation.

3.3 Cultural Resources

A summary of the prehistory and history of VAFB and PPAFS is included in Appendix A. Background research was conducted at VAFB, the Central Coast Information Center (CCIC) at the University of California, Santa Barbara (UCSB), and at the Northwest Information Center, (NWIC) at Sonoma State University, Rohnert Park, California. VAFB Geographic Information Systems (GIS) files were examined against the proposed project footprints to determine what previous work had been performed and what sites or isolated artifacts were known in the project vicinity. A 0.25 mile radius around each of the project areas was examined for previous archaeological studies and for previously recorded archaeological sites. Shane James, of Applied EarthWorks, Inc., performed a search of files held at the 30 CES/CEV Cultural Resources Office on VAFB on December 5, 2007. Records examined included topographic maps and site and report records. Mr. James also performed a record search at the CCIC on December 6, 2007. A search of PPAFS records held at the NWIC was performed by Information Center Staff on January 9, 2008.

3.3.1 VAFB

3.3.1.1 Physical Setting

The project location on VAFB is on south Base, on a peak of the Santa Ynez Mountains, part of the western Transverse Ranges. The mountains are composed of a thick sequence of Late Cretaceous and Tertiary sedimentary rocks (Morgan et al. 1991:47). The peak rises steeply from the coast to an elevation of 2,159 ft at the top of Tranquillion Mountain.

The Oak Mountain facility, also referred to as the Vandenberg Telemetry Receiving Station (VTRS), sits on the top of Sudden Peak at an elevation of 2,122 ft. Surrounding vegetation is primarily grassland with some coastal sage scrub on the north-facing slope of the peak.

Bedrock outcrops are present at the project location. Within the security fences, much of the ground surface has been graded and re-contoured, and vegetation removed or replaced with introduced ornamental species. This location has a thin mantle of sediment over shallow bedrock with little or no soil development. Given the shallow soils, buried archaeological deposits would not be expected. High elevation areas on south Base also have relatively few known sites and none occur within 0.25 mile of the facilities. There are, however, a few lithic scatters and quarrying locations on ridge tops and saddles on this part of the Base. Outcrops of chert are found in various places and many of these were quarried prehistorically.

3.3.1.2 Cultural Resources Studies

The project area on VAFB has been surveyed for cultural resources. A total of 21 archaeological studies have been completed within 0.25 mile of the project area (Table 3.5). Background research indicated that the Oak Mountain facility had not been previously surveyed. On December 13, 2007 Robert Peterson and Shane James of Applied EarthWorks, Inc., surveyed the Oak Mountain project area (Peterson and Lebow 2008). The two surveyors walked all non-paved areas within the project's area of potential effects (APE). Most of the project area is covered by pavement or structures so the surveyors examined all areas of exposed ground between and around the existing buildings. Visibility in these areas was good as most of the vegetation is short bunch grasses and surface exposure was between 60 and 80 percent. No archaeological materials were noted during the survey.

3.3.1.3 Archaeological Resources

No archaeological or historical sites have been recorded within 0.25 mile of the VAFB project location.

3.3.1.4 Cold War Resources

In the mid 1990s, Cold War related properties on VAFB and off-site facilities under its control were inventoried and evaluated as part of the U.S. DoD Legacy Resource Management Program. The evaluation was performed by the Tri-Services Cultural Resources Research Center of the U.S. Army Construction Engineering Research Laboratories (USACERL) (Nowlan et al. 1996). SAIC also evaluated the facilities at PPAFS in 1995 (Cole and Cagle 1995).

In July 2002, VAFB and the California SHPO executed the *Programmatic Agreement among Vandenberg Air Force Base, California, and the California State Historic Preservation Officer Regarding the Management of Exceptionally Important Cold War Historic Properties under the Jurisdiction of Vandenberg Air Force Base, California*. This programmatic agreement (PA) specifies how the Base will take into account the effects of its undertakings on Cold War resources as required under Sections 106 and 110 of the NHPA. In particular, the PA is geared toward addressing ongoing maintenance and other activities at these installations. The essence of the PA is contained in a *Historic Preservation Plan for the Management and Treatment of Cold War Properties at Vandenberg Air Force Base, California* (HPP).

The PA and associated HPP permit routine maintenance, repairs, and upgrades that do not affect the historic character, appearance, design, or function of National Register of Historic Places (NRHP) eligible properties without SHPO consultation. The Air Force will prepare documentation of substantial upgrades and modifications, including engineering documents, design plans, descriptive narratives, and before and after photographs. Such documentation will be kept on file at the 30 CES/CEV Cultural

Table 3.5. Cultural resources studies within 0.25 miles of project areas on VAFB.

Reference (listed chronologically)	Within APE	VAFB Reference Number	UCSB Reference Number
Glassow et al. (1976)		VAFB-1976-01	V-6
Neff and Snethkamp (1982)	X	VAFB-1982-05	E-3651/V-9
WESTEC Services, Inc. (1984)	X	VAFB-1984-02	E-3662/V-20
Greenwood and Foster (1984)	X	VAFB-1984-07	
Spanne (1984)	X	VAFB-1984-20	
Martin Marietta Corporation (1985)	X	VAFB-1985-09	
Gibson (1985)	X	VAFB-1985-15	E-3675/V-33
Martin Marietta Corporation (1986)		VAFB-1986-05	
Environmental Solutions, Inc. (1989)	X	VAFB-1989-07	
Berry (1985)			E-3772/V-130
SAIC (1994)			E-3851/V-209
SAIC (1995a)		VAFB-1995-15	
SAIC (1995b)		VAFB-1995-16	
Stevens and Crane (1996)	X	VAFB-1996-06	E-3940/V-304
Clark (1997)	X	VAFB-1997-01	E-3802/V-159
Tetra Tech, Inc. (1998)			E-3932/V-294
Carbone and Mason (1998)	X	VAFB-1998-03	
Owen and Lebow (2004)		VAFB-2004-03	
Lebow et. Al (2004)	X		E-3966/V-330
Spanne (2005)			E-3557
Peterson and Lebow (2008)	X		

Resources Office. More substantial undertakings that affect the ability of a site to convey its historic character and function, such as demolition, replacement, or removal of features that contribute to a site's significance, require formal consultation according to the standard Section 106 process.

The VTRS facilities at Oak Mountain were also evaluated by USACERL. Its primary mission is to track targets transmitting telemetry signals and to record and relay such signals. USACERL opined that it supported exceptionally important Cold War programs and that three of the facilities on the peak are eligible for the NRHP as contributing elements of the proposed WR Land Based Instrumentation Support Systems Historic District (WRLISSHD). The eligible facilities are Building 75 (the VTRS Control Center), Facility 81 (the 10-meter Autotrack Antenna [35-foot' ATTAS]), and Facility 86 (the GKR-7 Autotrack Telemetry Antenna) (Nowlan et al. 1996).

The proposed project calls for the decommissioning and replacement of the 35-foot ATTAS antenna and construction of a new UPS building adjacent to it. It also calls for installation of new cabling and consoles in Building 75 to support the new antenna. Two of the NRHP-eligible properties at the VTRS will therefore be directly affected.

3.3.2 PPAFS

3.3.2.1 Physical Setting

PPAFS is in San Mateo County approximately 20 miles south of San Francisco. It is on a

peninsula approximately 0.3 by 0.25 mile in size, with elevations ranging from about 80 to 180 ft above mean sea level (msl). It has been described in the 2005 Integrated Cultural Resource Management Plan (Gerber et al. 2005), and much of the following is from that source. It is connected to the mainland by a narrow isthmus on its northeastern side; its west and south sides are defined by steep cliffs. The top of the peninsula is relatively flat and the soils are highly erosive clay loams of the Tierra formation that have high potential for cliff retreat and landslides.

Diverse vegetation types are present. Vegetation on the interior station slopes, the north facing slopes behind the main facilities, and on the isthmus south and east of the road is coastal terrace prairie, consisting mainly of grasses and other herbaceous species. Monterey cypress and *Myoporum* have been used for landscaping within the fence. On the relatively undisturbed areas around the coastal bluffs, a well-developed coastal scrub occurs. This vegetation type also appears on the top of the coastal terrace and isthmus, but has been suppressed by mowing, with coastal terrace prairie and introduced grasses having taken over. In those areas, as well as along roads and trails, introduced annuals are well established. Coastal swale habitat is present along the upper gully following the spine of the peninsula. Willow scrub thickets occur around the main stream channel feeding Princeton Marsh, including the gully between the marsh and the paved access road to the radar tower and a portion of the isthmus (Gerber et al. 2005).

Given the steep cliffs, lack of potable water, and poor shoreline access on the peninsula itself this area is not likely to have been heavily occupied prehistorically. It is also a non-depositional environment, so buried deposits are unlikely. The presence of Princeton Marsh north of the peninsula was undoubtedly more attractive for prehistoric occupants, an inference confirmed by the distribution of known sites near the marsh, all of which are north of the facility near the marsh and on the neck of land connecting the facility area to the mainland.

3.3.2.2 Cultural Resources Studies

The project area has been surveyed for cultural resources. A total of seven archaeological studies have been completed within 0.25 mile of the PPAFS project area (Table 3.6). In 1993 Alex Kirkish, of the 30 CES/CEV Cultural Resources Office at VAFB, surveyed PPAFS for cultural resources. He relocated and confirmed the presence of two previously recorded sites and recorded one additional site. Inventory and evaluation of all cultural resources on PPAFS was completed in early 2005 when Flint et al. (2005) completed testing and evaluation of identified sites on or adjacent to Air Force property.

3.3.2.3 Archaeological Resources

One site, CA-SMA-347, is within 0.25 mile of the PPAFS project area. CA-SMA-347 was recorded by Kirkish in 1994 as a lithic scatter with some shell on the marine terrace near the base of the narrow neck of land on the north end of the facility. The site sits on a knoll on a north-facing slope overlooking a large cove. Vegetation in the vicinity is primarily coastal sage scrub. Lithic debitage includes both chert and quartzite, and tools consist of a split cobble with marginal percussion flaking and a bipolar flake tool with steep retouching along one margin.

Applied EarthWorks, Inc. tested the site in 2004 (Flint et al. 2005) to define the horizontal and vertical extent of the cultural deposit; identify the stratigraphy and depositional history; define the types and densities of cultural materials present; and evaluate the site's eligibility for the NRHP. A total of 20 shovel test pits (STPs), three test excavation units (TEUs), and two 10 centimeter deep surface transect units were dug. Total excavation volume was 4.87 cubic meters. A sparse scatter of lithic debitage, two unpatterned flake tools, and less than 10 grams of unidentifiable shell were recovered. Flint et al. (2005) opined that CA-SMA-347 is not eligible for the NRHP.

CA-SMA-347 is outside the planned work areas and will not be affected by any of the

Table 3.6. Cultural resources studies within 0.25 miles of project areas on PPAFS.

Reference (listed chronologically)	Within APE	VAFB Reference Number	UCSB Reference Number
Brandt (1980)			
Clark (1989)			
Kirkish (1993)	X	VAFB-1993-07-OS	
Cole and Cagle (1995)	X	VAFB-1995-13-OS	
Tetra Tech (1999)	X	VAFB-EA-0999	
Farquahar (2000)	X	VAFB-2000-14-OS	
Flint et al. (2005)	X	VAFB-2004-05	

proposed construction associated with modernization of Command Transmit CT-4 and the Telemetry Receiving Station at PPAFS.

3.3.2.4 Cold War Resources

In 1995 SAIC completed an evaluation of the facilities at the PPAFS (Cole and Cagle 1995), as did the USACERL study (Nowlan et al. 1996). Based on these efforts, three buildings or structures on PPAFS were evaluated as eligible for the NRHP as contributing elements of the WRLISSHD, because they supported exceptionally important Cold War programs. These are Facility 18 (the AN/FPQ-6 Radar), and Facilities 22 and 40 (telemetry antennas). These facilities are included in the Cold War PA and associated Historic Properties Treatment Plan negotiated between the California SHPO and VAFB, and have been officially determined eligible for the NRHP.As of June 2005, two additional SHPO consultations had been conducted for PPAFS, both regarding Cold War concerns. 30 CES/CEV Cultural Resources Office conducted the first in 1996–1997 for removal/replacement of a radar antenna (Building 22). 30 CES/CEV Cultural Resources Office also conducted the second in 1999 for demolition of the north end of Facility 17 in association with the road repair (Gerber et al. 2005).

The proposed WR IMP work at PPAFS includes construction of three new antennas with radomes at unoccupied locations, construction of an addition on Building 17, demolition of Building 9, construction of a new paved access road. These actions will not affect any of the NRHP eligible facilities.

3.4 Hazardous Materials and Hazardous Waste Management

Hazardous materials and wastes are those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act, as amended by the Superfund Amendments and Reauthorization Act (42 U.S.C. 9601-9675), Toxic Substances Control Act (TSCA; 15 U.S.C. 2601-2671), the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA; 42 U.S.C. 6901-6992), and as defined in the State of California corresponding laws and regulations. In addition, federal and state Occupational Safety and Health Administration (OSHA) regulations govern protection of personnel in the workplace. In general, the definitions within the citations include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present

substantial danger to public health and welfare, to workers, or the environment.

3.4.1 Hazardous Material Management

VAFB uses approximately 5,000 hazardous materials items to accomplish its mission and mission support activities. The hazard potential of the materials used range across the spectrum of toxicity. Users of hazardous materials must also comply with California Business Plan requirements. Management of hazardous materials used on VAFB follows procedures found in 30 Space Wing Plan (SWP) 32-7086, *Hazardous Materials Management Plan*. The Base uses a Hazardous Materials Pharmacy (HazMart), wherein the HazMart maintains inventories of hazardous materials, whether purchased by the Air Force or its contractors. Before releasing hazardous materials to the user, HazMart staff ensures a copy of the Material Safety Data Sheet is available and verifies that the material is suitable for use on VAFB. By providing handling and use information, VAFB controls the potential misuse of hazardous materials, maintains an accounting of the types of hazardous materials used on the Base, and accomplishes usage and emissions reports as required by federal, state and local environmental regulations. Most hazardous materials used at PPAFS are not processed through the VAFB HazMart, but comply with state and local requirements as implemented and regulated at the point of sale. These hazardous materials requirements are found in the environmental specifications portion of Air Force contracts. In addition to Air Force requirements, contractors operating on Air Force property are subject to all federal, state, and local hazardous materials regulations, and are subject to inspection by a variety of federal, state and local regulatory agencies.

Hazardous materials potentially used during construction and demolition projects include petroleum, oil and lubricants (POLs) in equipment and vehicles, solvents for asphalts, paints and coatings; and in paint abatement or equipment cleaning; and compressed gases for welding or cutting equipment.

3.4.2 Hazardous Waste Management

Management of hazardous waste at VAFB and PPAFS complies with the RCRA Subtitle C (40 CFR Part 240-299) and with California Hazardous Waste Control Laws as administered by the California EPA (Cal EPA), Department of Toxic Substances Control, under Title 22, Division 4.5 of the California Code of Regulations (CCR). These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled according to defined procedures. The VAFB *Hazardous Waste Management Plan*, 30 SWP 32-7043A, outlines the procedures to be followed for hazardous waste management.

Contractors generating hazardous wastes in support of a government contract are required to follow federal, state, and local laws and regulations, and use the Air Force Generator Identification Number to account for hazardous wastes generated. Because of the amount of hazardous waste generated per month under its Generator Identification Number, VAFB is classified as a large quantity, fully regulated generator, required to comply with all laws regulating the generation, storage, transportation, and disposal of hazardous waste. PPAFS has its own Generator Identification Number, and based upon lesser amounts generated, is classed as a Small Quantity Waste generator. Both VAFB and PPAFS employ a “cradle to grave” waste management approach. Hazardous waste is accumulated following rules applicable to either the larger quantity or small quantity generator status. Waste is transferred off-site in properly labeled Department of Transportation approved container from its point of origin to a permitted off-site treatment storage or disposal facility. The VAFB *Hazardous Waste Management Plan* provides detailed procedures for hazardous waste accumulation and management. Construction/demolition contractors would use the Air Force (VAFB or PPAFS) Generator Identification Number, and

would have to comply with the VAFB *Hazardous Waste Management Plan*. Hazardous waste is removed from VAFB or PPAFS under hazardous waste manifest, and shipped off-site for final disposal.

Hazardous wastes most likely encountered by workers during demolition activities could include asbestos containing material (ACM); LBP; PCB oils, coatings and electrical devices; smoke detectors; and universal wastes such as fluorescent lamps, other electronic wastes; batteries; and mercury-filled thermostats.

3.4.3 Asbestos Abatement Management

The U.S. EPA and OSHA define ACM as any material or product that contains greater than one percent asbestos. The California OSHA defines asbestos-containing construction material as any manufactured construction material that contains more than one percent asbestos (CCR Title 8, Section 1529(b), definitions). Air Force Instruction (AFI) 32-1052, *Facilities Asbestos Management*, establishes requirements and assigns responsibilities to incorporate facility asbestos management principles and practices into all Air Force asbestos programs. The AFI ensures compliance with the U.S. EPA National Emission Standards for Hazardous Air Pollutants (40 CFR 61.140) and the OSHA Asbestos Construction Standards (29 CFR 1926.1101). The VAFB *Asbestos Management Plan* (30 SWP 32-052A), and the *Asbestos Operating* Plan (30 SWP 32-1052B) are VAFB's primary documents for implementing the objectives of facility asbestos management, and ensure compliance with applicable federal, state, and local regulations.

Notification of demolition of regulated structures must be made to the local air pollution control district no later than 10 working days prior to the start of the project even if there is no asbestos present in the facility. The SBCAPCD is the local regulatory agency for VAFB, while the BAAQMD is the local authority for PPAFS. A copy of the notification must be sent to and approved by the 30 CES/CEV Compliance Office, Asbestos Program Manager, before submittal to the local regulatory agency. The 30 CES/CEV Compliance Office must approve all projects prior to the start of work. Conditions for project approval include requirements for training, building surveys, and project management. Persons contracted to perform asbestos abatement, building surveys, and project management must be certified in accordance with Title 8 CCR, Section 341.15.

All demolition projects must incorporate an asbestos survey into the design process. Demolition work cannot occur without a facility survey. Many facilities on VAFB have asbestos survey information on file in the 30 CES/CEV Compliance Office. If additional surveys are required, the surveys must be conducted by a state certified asbestos consultant or an asbestos site surveillance technician. Sampling and surveys are conducted in accordance with 40 CFR Part 763. Detailed demolition contract requirements would include building-specific asbestos abatement specifications; completion of an up-to-date asbestos survey for each specific facility, including maps, drawings, or sketches indicating the exact location of the ACM; and a requirement to obtain demolition permits. Contract provisions would also include the requirement to notify the SBCAPCD or BAAQMD and all other regulatory agencies of any revisions in the project design.

3.4.4 Lead-Based Paint Management

The U.S. EPA and Cal EPA test for and regulate wastes exhibiting the characteristic of toxicity in different manners. Both agencies test metal-bearing wastes for toxicity based on the potential for leaching of metals. The U.S. EPA uses the Toxicity Characteristic Leaching Procedure, and sets the Threshold Limit Value, also named Maximum Concentration of Contaminant for the Toxicity Characteristic, for lead leachate at 5.0 milligrams per liter (mg/L). Cal EPA regulates wastes for toxicity using the Waste Extraction Test (WET) to determine the

amount of extractable substance in a waste. Title 22, Division 4.5, Chapter 11, Article 5 Appendix II of the California Code of Regulations describes how and when the WET procedures are used. For lead and lead compounds the Total Threshold Limit Concentration (TTLC) is 1,000 milligrams per kilogram (mg/kg) and the Soluble Threshold Limit Concentration is 5.0 mg/L. Based upon the determination of metals toxicity, the California Health and Safety Code Section 25141.5(b) (3) (A) may allow the disposal of wastes, which are hazardous *only* due to exceeding applicable TTLCs for inorganic constituents, to be disposed of in a Class I, II or III non-hazardous waste disposal unit provided certain conditions are met.

Many of the facilities involved in this Proposed Action were constructed between the early 1960s (VAFB Oak Mountain Building 75) to the late 1970s (PPAFS Building 10), and potentially contain quantities of LBP. The VAFB *Lead-Based Paint Management Plan* (30 SWP 32-1002) provides specific direction in LBP management. The plan contains strategies to identify, evaluate, and eliminate lead, pursuant to LBP standards; protect facility occupants and workers from LBP hazards; and properly dispose of lead-containing waste.

Demolition projects include LBP surveys and sampling, as required. These surveys include risk assessment to define the source and extent of lead exposure hazards and review of data from LBP testing and bulk or X-ray fluorescence testing for non-priority buildings.

3.4.5 Polychlorinated Biphenyls and Dioxins

PCBs are occasionally found in oils, coatings, transformers, older fluorescent lighting ballasts, and electrical devices or appliances with PCB capacitors. PCB production in the U.S. ceased in 1997. PCBs are regulated under the TSCA (40 CFR Parts 750 and 761) and Title 22 of the CCR.

Dioxins, like PCBs belong to a family of toxic chemicals that share similar chemical structure and a common mechanism of toxic action. This family includes seven of the polychlorinated dibenzo dioxins (PCDDs), ten of the polychlorinated dibenzo furans (PCDFs), and twelve of the PCBs. PCDDs and PCDFs are not commercial chemicals but are trace level unintentional byproducts of most forms of combustion (U.S. EPA, *Persistent Bioaccumulative and Toxic Chemical Program*). During the demolition of buildings, dioxins are likely to be encountered in areas where PCBs may have been used, where structures may have been involved in fires, or where deposition of soot may have occurred as the result of combustion. Materials contaminated by or containing any level of PCBs, dioxins, and or furans, cannot be accepted for recycling or disposal at the VAFB Landfill. Appropriate management may require disposal of PCB or PCB contaminated materials in approved Lined Landfills or Hazardous Waste Treatment or Disposal facilities.

3.4.6 Installation Restoration Program

The federal Installation Restoration Program (IRP) was implemented at DoD facilities to identify, characterize, and restore hazardous substance release sites. There are currently 136 IRP sites throughout VAFB grouped into six Operable Units based on similarity of their characteristics. No IRP sites occur at PPAFS.

IRP sites are remediated through the Federal Facilities Site Remediation Agreement (FFSRA), a working agreement between the USAF, the Central Coast RWQCB, and the Department of Toxic Substances Control. In addition to IRP sites, there are identified Areas of Concern (AOCs), where potential hazardous material releases are suspected; and Areas of Interest (AOI), defined as areas with the potential for use and/or presence of a hazardous substance. Various contaminants could be present at these sites including trichloroethylene (TCE), PCBs, volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), asbestos, and other hazardous contaminants.

One AOI (AOI-122) occurs on VAFB within the Oak Mountain project area for the

Proposed Action. This AOI has been closed. At PPAFS, one AOC (AOC-19) is present within the footprint of the Proposed Action. This site is presently under investigation.

3.5 Human Health and Safety

All construction activities and facility operations and maintenance on VAFB and PPAFS are subject to the requirements of the federal OSHA regulations. Moreover, California OSHA has jurisdiction over non-federal operations south of Honda Ridge Road on south VAFB.

The affected environment for Health and Safety is the regulatory environment for health and safety issues established to minimize or eliminate potential risk to the general public and personnel involved in the instrumentation modernization upgrades at VAFB and PPAFS.

Relevant health and safety requirements include industrial hygiene and ground safety. Industrial hygiene is the joint responsibility of the 30 SW Safety Office (30 SW/SE) and the 30th Medical Operations Squadron, Bioenvironmental Engineering Element (30 MDOS/SGOAB), and contractor safety departments. Responsibilities include monitoring of exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of workers subject to chemical exposures, and oversight of all hazardous or potentially hazardous operations. Ground safety is the responsibility of the 30 SW/SE and includes protection from hazardous situations and hazardous materials.

Hazardous materials, primarily POLs, would be used for operating equipment and vehicles under the Proposed Action. The potential exists for unexpected releases of these POLs, which would generate hazardous waste. Therefore, the potential exists for persons participating in these projects to become exposed to hazardous materials and hazardous waste. In addition, the following physical features have the potential to be present in the vicinity of the project area, and have the potential to adversely impact the health and safety of site workers:

- Physical hazards including traffic in the roads, holes and ditches, uneven terrain, sharp or protruding objects, slippery soils or mud, and unstable ground.
- Biological hazards such as animals (insects, spiders, and snakes), and disease vectors (ticks and rodents).

The Noise Control Act (NCA; 42 U.S.C. 4901 *et seq.*) sought to limit the exposure and disturbance that individuals and communities experience from noise. It focuses on surface transportation and construction sources, particularly near airport environments. The NCA also specifies that performance standards for transportation equipment be established with the assistance of the Department of Transportation. Section 7 of the NCA regulates sonic booms and gives the Federal Aviation Administration regulatory authority after consultation with the U.S. EPA. In addition, the 1987 Quiet Community amendment gave state and local authorities greater involvement in controlling noise.

Noise is often defined as unwanted sound that can interfere with normal activities or otherwise diminish the quality of the environment. Depending on the noise level, it has the potential to disrupt sleep, interfere with speech communication, or cause temporary or permanent changes in hearing sensitivity in humans and wildlife. Noise sources can be continuous (e.g., constant noise from traffic or air conditioning units) or transient (e.g., a jet overflight or an explosion) in nature. Noise sources also have a broad range of frequency content (pitch) and can be nondescript, such as noise from traffic or be specific and readily definable, such as a whistle or a horn. The way the acoustic environment is perceived by a receptor (animal or person) is dependent on the hearing capabilities of the receptor at the frequency of the noise, and their perception of the noise. (URS 1986)

The amplitude of sound is described in a unit called the decibel (dB). Because the human ear covers a broad range of encountered sound pressures, decibels are measured on a quasi-logarithmic scale. The dB scale simplifies this range of sound pressures to a scale of zero to 140 dB and allows the measurement of sound to be more easily understood.

There are many methods for quantifying noise, depending on the potential impacts in question and on the type of noise. One useful noise measurement in determining the effects of noise is the one-hour average sound level, abbreviated L_{eq1H}. The L_{eq1H} can be thought of in terms of *equivalent* sound; that is, if a L_{eq1H} is 45.3 dB, this is what would be measured if a sound measurement device were placed in a sound field of 45.3 dB for one hour. The L_{eq1H} is usually A-weighted unless specified otherwise. A-weighting is a standard filter used in acoustics that approximates human hearing and in some cases is the most appropriate weighting filter when investigating the impacts of noise on wildlife as well as humans. Examples of A-weighted noise levels for various common noise sources are shown in Table 3.7.

Another useful acoustical metric for describing sound events is the A-weighted sound exposure level (SEL). The A-weighted SEL is the total sound energy in a sound event *if that event could be compressed into 1 second.* In essence, SEL is an average sound level that is condensed into one-second. This provides a time-normalized metric and allows for analysis of events with different durations. As an example, an F-16 aircraft overflight (85 percent full power, altitude 210 ft, speed of 443 knots) was measured to have an A-weighted SEL of 113.1 dB (Berry et al. 1991).

The "peak sound level" is the greatest instantaneous sound level reached during a sound event. Peak levels also have various frequency weightings applied to them. Peak levels, though useful in some cases, can often be misleading because a single peak in a complex waveform can be substantially greater than the majority of a sound event. Therefore, peak levels should always be presented along with one or more of the metrics described above to better describe the sound event. An unweighted peak sound level is simply the peak sound level with no frequency weighting applied.

Existing noise levels on VAFB are generally quite low due to the large areas of undeveloped landscape and relatively sparse noise sources. Background noise levels are primarily driven by wind noise; however, louder noise levels can be found near

Table 3.7. Comparative A-weighted sound levels.

Noise Level	Common Noise Levels	
(dBA)	Indoor	Outdoor
100 – 110	Rock band inside New York subway	Jet flyover at 304 meters
90 – 100	Food blender at one meter	Gas lawnmower at one meter
80 – 90	Garbage disposal at one meter	Diesel truck at 15 meters; noisy urban daytime
70 – 80	Shouting at one meter; vacuum cleaner at three meters	Gas lawnmower at 30 meters
60 – 70	Normal speech at one meter	Commercial area heavy traffic at 100 meters
50 – 60	Large business office; dishwasher next room	
40 – 50	Small theater or large conference room (background)	Quiet urban nighttime
30 - 40	Library (background)	Quiet suburban nighttime
20 - 30	Bedroom at night	Quiet rural nighttime
10 - 20	Broadcast and recording studio (background)	
0 – 10	Threshold of hearing	

dBA = A-weighted decibel

industrial facilities and transportation routes. Rocket launches and aircraft over flights create louder intermittent noise levels. On VAFB, general ambient L_{eq1H} measurements have been found to range from around 35 to 60 dB (Thorson et al. 2001). Most activities associated with the Proposed Action would generate relatively continuous noise.

RF Transmitter Hazards

TM antennas are receive only antennas, posing no potential risk associated with RF transmissions. CT antennas are narrow beam, command/destruct transmitters that can be designated operationally in azimuth from 153 to 301 degrees (º), and designated in elevation from +3º to +90º. The RF input to a CT antenna is 10 kilowatts. Antennas are calibrated on the day of launch to track rocket or missile launches from VAFB, and provide the Air Force positive command, and control to destroy the rocket or missile if its flight becomes anomalous. RF energy emanating from CT antennas is recognized as having the potential to result in adverse effects on human health and safety. Personnel and other equipment are protected by software inhibits and mechanical blocks from being irradiated by the RF emitted from these antennas. Additional safety features will be covered in the Programmatic Environment, Safety, and Occupational Health Evaluation for this program.

Only one CT transmit antenna per site is operational during each launch. The second CT antenna serves as a backup. CT antennas are active for approximately eight hours during each launch, with an additional six hours for extended operations. An average of 15 launches annually is anticipated through 2012. Antennas can also be activated for maintenance, training, and other support operations.

The size of the hazard areas associated with RF transmitters vary depending on transmitter power and the antenna characteristics. The effects of RF energy on humans depend on the frequency of the incident radiation field, the polarization of the field, the size, and shape of the person, and their ability to dissipate absorbed energy. There are no specific standards for RF radiation. Human exposure to RF is controlled in accordance with national exposure standards (e.g., federal and voluntary exposure standards), as set forth in the following documents:

- Institute of Electrical and Electronics Engineers (IEEE) Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kilohertz (kHz) to 300 gigahertz (GHz), May 1999.
- DoD, Protection of DoD Personnel from Exposure to Radio Frequency Radiation and Military Exempt Lasers, DOD 6055.11, February 21, 1996.
- Air Force Occupational Safety and Health (AFOSH) Standard, Radio Frequency Radiation (RFR) Safety Program, AFOSH Standard 48-9, August 1, 1997.
- Federal Communications Commission (FCC), Office of Engineering and Technology (OET) Bulletin 65: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields, Edition 97-01, August 1997.

The Air Force follows AFOSH Standard 48-9 and FCC OET Bulletin 65 maximum permissible exposure of 420 MHz to assess potential risks to human health and safety associated with RF energy emitted by equipment such as CT antennas. The uncontrolled permissible exposure limit for CT antennas is 0.28 mW/cm^2 averaged over a 30-minute period, while the controlled permissible exposure limit is 1.4 mW/cm^2 averaged over a 6-minute period. Signage is required to be posted alerting of the entry into a controlled RF energy area.

In 2007, the Air Force completed a RF energy evaluation of a CT antenna (G. VanOsdol, pers. comm.). The antenna was assumed to be at its lower operational limit of +3º, with an input to the antenna of 8,941 watts (based on a transmitter output of 10,000 watts and a conservative transmission system loss of

0.5 dB). The results of this evaluation indicated that if an individual is a minimum of 10º on either side of the center of the main beam, at any distance, the exposure is less than the uncontrolled level of 0.28 mW/cm^2 established by AFOSH Standard 48-9 (ITT 2008). Table 3.8 provides the results of these measurements while Figure 3.1 describes the hazard area in front of the CT-1 ViaSat antenna.

3.6 Solid Waste Management

In 1989, the California Integrated Waste Management Act (Assembly Bill 939) mandated a 50 percent reduction in the quantity of solid waste disposed of in California landfills. The 50 percent reduction was to be accomplished by January 1, 2000, and was measured against a 1990 baseline. In 1994, the Air Force mandated similar waste diversion requirements, using a 1992 baseline. The most recent solid waste diversion requirements applicable to this EA were enacted through California Senate Bill 1374, *Solid Waste: Construction and Demolition Waste Materials: Diversion Requirements Ordinance.* On March 1, 2004, the California Integrated Waste Management Board (CIWMB) promulgated a model ordinance for local agencies to follow for implementing a 50 to 75 percent diversion of construction and demolition (C&D) debris from landfills.

The Air Force operates a landfill at VAFB, and is permitted to accept solid wastes that meet the definitions of C&D debris and inert wastes. As part of the Santa Barbara County *Model* waste shed, the VAFB Landfill would be subject to a locally adopted diversion ordinance because the Federal Facilities Compliance Act waived sovereign immunity with respect to California solid waste programs. However, because diversion rates within the county are meeting state mandates, the local enforcement agency, the Santa Barbara County Environmental Health Services Division, has not promulgated a model C&D waste diversion ordinance.

For the VAFB Landfill 30 CES/CEV established a minimum 85 percent diversion rate by total weight for C&D materials. Inert materials are highly recyclable with proper pre-planning for segregation and on-site management. Steel, non-chemically treated wood, concrete, waste soil, and asphalt generated as a result of demolition actions would be expected to have a diversion rate higher than 85 percent. Typically, such materials are 100 percent divertible with proper planning and practices. VAFB policy is that C&D materials will be managed on VAFB to the maximum extent possible. Efforts to minimize using capacity of off-Base Santa Barbara County recyclers will be incorporated into all project planning. Off-base disposal of solid waste within Santa Barbara County is not authorized for these demolition efforts.

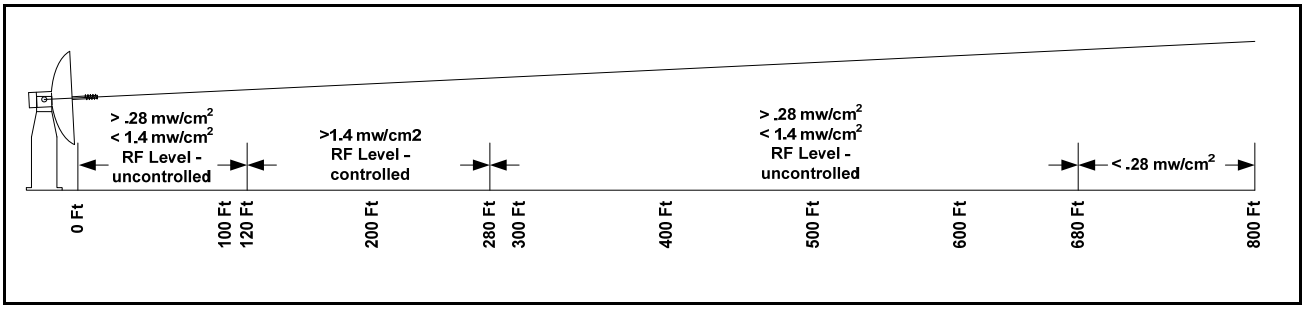

Figure 3.1. RF hazard areas in front of CT-1 ViaSat Antenna.

Table 3.8. RADHAZ for the CT-1 ViaSat Antenna at 3º elevation, 8,941 watts transmit power.

Ground Distance [G_D] (Feet)	Delta Height (Feet)	Beam Angle (º at G_D)	Relative Antenna Gain (dB)	Absolute Antenna Gain (dB)	Absolute Antenna Numeric Gain	Power Density (mW/cm^2)
0.00	12.00	93.0	-36.0	-11.69	0.07	0.36
20.00	13.05	34.0	-29.6	-5.29	0.30	0.42
40.00	14.10	19.7	-25.0	-0.69	0.85	0.37
60.00	15.14	14.3	-19.2	5.11	3.24	0.66
80.00	16.19	11.5	-16.0	8.31	6.78	0.79
100.00	17.24	9.8	-12.0	12.31	17.02	1.28
120.00	18.29	8.7	-9.4	14.91	30.97	1.63
140.00	19.34	7.9	-8.0	16.31	42.76	1.66
160.00	20.39	7.3	-6.0	18.31	67.76	2.01
180.00	21.43	6.8	-5.8	18.51	70.96	1.67
200.00	22.48	6.4	-5.0	19.31	85.31	1.63
220.00	23.53	6.1	-4.1	20.21	104.95	1.65
240.00	24.58	5.9	-4.0	20.31	107.40	1.42
260.00	25.63	5.6	-3.5	20.81	120.50	1.36
280.00	26.67	5.5	-3.4	20.91	123.31	1.20
300.00	27.72	5.3	-3.3	21.01	126.18	1.07
320.00	28.77	5.1	-3.1	21.21	132.13	0.99
340.00	29.82	5.0	-3.0	21.31	135.21	0.89
360.00	30.87	4.9	-2.8	21.51	141.58	0.84
380.00	31.91	4.8	-2.6	21.71	148.25	0.79
400.00	32.96	4.7	-2.4	21.91	155.24	0.74
420.00	34.01	4.6	-2.4	21.91	155.24	0.67
440.00	35.06	4.6	-2.4	21.91	155.24	0.61
460.00	36.11	4.5	-2.3	22.01	158.85	0.57
480.00	37.16	4.4	-2.2	22.11	162.55	0.54
500.00	38.20	4.4	-2.2	22.11	162.55	0.50
520.00	39.25	4.3	-2.2	22.11	162.55	0.46
540.00	40.30	4.3	-2.2	22.11	162.55	0.43
560.00	41.35	4.2	-2.2	22.11	162.55	0.40
580.00	42.40	4.2	-2.2	22.11	162.55	0.37
600.00	43.44	4.1	-2.0	22.31	170.22	0.36
620.00	44.49	4.1	-2.0	22.31	170.22	0.34
640.00	45.54	4.1	-2.0	22.31	170.22	0.32
660.00	46.59	4.0	-2.0	22.31	170.22	0.30
680.00	47.64	4.0	-2.0	22.31	170.22	0.28
700.00	48.69	4.0	-2.0	22.31	170.22	0.27
720.00	49.73	4.0	-2.0	22.31	170.22	0.25
740.00	50.78	3.9	-1.9	22.41	174.18	0.24
760.00	51.83	3.9	-1.9	22.41	174.18	0.23
780.00	52.88	3.9	-1.9	22.41	174.18	0.22
800.00	53.93	3.9	-1.9	22.41	174.18	0.21

Uncontrolled area: > 0.28 mW/cm^2 < 1.4 mW/cm^2

Controlled area: > 1.4 mW/cm^2

< 0.28 mW/cm^2

The VAFB Landfill is 172 acres; while the RCRA Subtitle D disposal footprint is 46 acres (that part of the facility that has received or is receiving wastes and that has not been closed in accordance with 40 CFR Part 258). The VAFB Landfill does not charge a tipping fee to authorized Base organizations, dormitory residents or authorized Base contractors. The Federal Correctional Institute and U.S. Penitentiary, Lompoc, although a part of the county wasteshed, use the VAFB Landfill for disposal of their wastes and are charged a fee for solid waste disposal. Some operations and lessees within the confines of VAFB are not granted access to the VAFB Landfill, and make their own arrangements for solid waste management.

Through a 30 SW contract, a commercial contractor collects refuse and recyclables generated on Base and operates the VAFB Landfill. Operational oversight of the contractor is provided by the 30 CES Operations Flight, with environmental oversight provided by the 30 CES/CEV. The contract includes pre-arranged collection routes for both recycled material and refuse. The contractor provides all personnel, equipment, tools, materials, supervision, and other items and services necessary to meet contract requirements. Collected refuse is disposed of in the VAFB Landfill. Recyclable materials are prohibited from landfill disposal and are taken to off-Base recovery facilities. Special projects are authorized to use the VAFB Landfill if their contract with the Air Force so stipulates. Project contractors make arrangements to use the VAFB Landfill but are required to segregate and transport their solid wastes to designated disposal areas within the landfill.

Due to the detailed tracking requirements for waste disposal and diversion levied by the state of California, VAFB is required to track all materials going off Base for diversion, recycling, or disposal. VAFB reports on the weight (in tons), the type of material, and the destination. Additionally, any materials recycled on Base by processes other than the VAFB Landfill, must be reported to the 30 CES/CEV P2 Office, Solid Waste Manager, at least quarterly, with copies of weight tickets and receipts provided. The party/unit responsible for the diversion, disposal, or recycling is responsible for reporting the information to the Solid Waste Manager.

The VAFB Landfill is classified as a Class III Sanitary Landfill, pursuant to Solid Waste Facility Permit (SWFP) # 42-AA-0012 issued on August 19, 2005, by the CIWMB; and enforced by Santa Barbara County Environmental Health Services, the local enforcement agency (LEA). The landfill is also subject to requirements found in RWQCB Waste Discharge Requirement (WDR) Order No. R3-2004-151, dated November 19, 2004; and the Monitoring and Reporting Program No. R3-2004-151, dated November 19, 2004. In June 2006, VAFB submitted a Joint Technical Document (JTD) amendment, # 42-AA-0012, which was accepted by the LEA. The LEA concluded that the JTD did not require any change to the August 2005 SWFP.

The VAFB Landfill has several designated disposal areas: The active face of the landfill; a non-friable asbestos disposal area; an animal cemetery, and a wood yard. SWFP # 42-AA-0012 allows disposal of 400 tons per day (tons/day), and a traffic volume of 99 vehicles per day. Under WDR No. R3-2004-0151 section, *Waste Type & Classification (paragraph 18)*, of the 400 tons of waste per day: 374 tons are allotted for general non-hazardous waste, 18 tons for separated or commingled recyclables, and 8 tons for miscellaneous non-hazardous waste as allowed in Section 14 of the permit. Section 14 items include: non-friable asbestos; small animal carcasses; separated C&D debris; wood or green wastes to be chipped for recycling or alternate daily cover; waste tires to be hauled off-site for recycling or incineration; and properly treated medical waste as defined in the California Health and Safety Code, Chapter 8, Section 117600, et seq. (medical wastes are not accepted and are managed under separate contract). The VAFB Landfill is prohibited from accepting:

liquid wastes, including grease; sewage sludge and septic tank pumping; burning waste; hot ashes; untreated medical waste; non-hazardous waste requiring special handling; designated waste; hazardous waste; radioactive waste; and treated wood waste.

As stated in the VAFB June 2006 *Application for Solid Waste Facility Permit/Waste Discharge Requirements,* the current permitted capacity is 2,464,000 cubic yards (yd^3) with a remaining site capacity of 2,179,447 yd^3 (Dec-04, data). Based upon a waste to cover ratio of 4:1, an in-place waste density of 1,000 pounds per cubic yard, and historical disposal tonnage, the closure date for the landfill is estimated to be 2089. Although permitted for a peak daily tonnage of 400 tons, the average daily tonnage is approximately 35 tons per operating day. The four most recent Quarterly Reports (Dec 06 to Sep 07) show daily disposal tonnages of 29, 28, 36, and 27 tons/day. The increase in the summer of 2007 is attributable to a large military family housing demolition project.

The Air Force does not have a landfill at PPAFS and relies upon San Mateo County landfill resources for its solid waste disposal. The City of Half Moon Bay, immediately adjacent to PPAFS, amended its municipal code to implement Assembly Bill 939, and required a *Construction and Demolition Debris Waste Management Plan* for any person requiring a building permit valued at $5,000 or more. A *Contractor's Guide to Construction and Demolition Debris Waste Management Plan* is provided by the city. The County of San Mateo adopted Ordinance 04099 in February of 2002. The county ordinance applies to PPAFS as an unincorporated area within the county. Solid waste, and in particular C&D debris, are subject to the recycling and diversion components of Ordinance 04099.

3.6.1 Construction and Demolition Debris

VAFB and PPAFS C&D projects generally originate from program management and planning requirements in support of Air Force missions and activities associated with these locations. Projects for new construction can range from multi-story administrative buildings to space launch complexes. Demolition projects range from removal of World War II wooden structures, to military family housing replacement, to demolition of obsolete launch complexes and facilities. The debris from these projects includes, but is not limited to, concrete, asphalt, wood waste, dry wall material, and glass.

Debris from new construction is typically uncontaminated and is reused or recycled whenever feasible. Material segregation and storage are also less of a problem with new construction than with demolition. Debris from demolition projects is sometimes less amenable to reuse or recycle because the structure may be painted with LBP, contain ACM, and have treated woods in structural and finishing materials. This debris may have to be managed as hazardous waste. Demolition projects must also overcome cost differentials wherein it may be less expensive to demolish a structure than to deconstruct or dismantle it. Cost differentials between tipping fees and costs associated with reuse and recycling also influence disposal decisions.

3.6.2 Pollution Prevention

Both the State of California and the Air Force have mandated a reduction in the quantity of solid waste disposed of in landfills. The Pollution Prevention Act (PPA) of 1990 refocused the national approach to environmental protection from merely compliance with waste management requirements toward P2. Implementation of the Air Force Environmental Management System (EMS) carries P2 a step further toward mission sustainability principles. The P2 program and evolving EMS provide a policy aimed at achieving objectives and targets, through documented practices, procedures, and operational requirements. VAFB will continue to implement EMS and its associated P2 program elements by following the P2 hierarchy:

- Reduce (source reduction to prevent the creation of wastes);
- Reuse (keep item or material for its intended purpose);
- Recycle (use item or material for some other beneficial purpose);
- Disposal (in an environmentally compliant manner, only as a last resort).

3.7 Transportation

3.7.1 VAFB and Vicinity

VAFB is located approximately five miles west of the City of Lompoc. Two main highways connect VAFB and metropolitan areas in the region (Figure 1.1). U.S. Highway 1 (U.S. 1), a north-south highway, traverses VAFB and provides access to Santa Maria to the northeast, and Santa Barbara to the southeast when used in conjunction with U.S. Highway 101 (U.S. 101). SR 246, an east-west highway, provides access to Lompoc to the east and Santa Barbara to the southeast when used in conjunction with U.S. 101.

Vehicles enter VAFB from SR 246 and U.S. 1 through several gates (Figure 3.2). North Base is primarily accessible from four gates: Santa Maria Gate, Solvang Gate, Lompoc Gate, and Utah Gate. U.S. 1 services the Santa Maria Gate, the main gate, which provides access to the northern side of the cantonment area, and the Lompoc Gate. The Utah Gate is immediately northwest of the Santa Maria Gate and is mainly used by housing traffic. SR 246, known in Lompoc as Ocean Avenue, services the Solvang Gate. Directly across SR 246 from the Solvang Gate is the South Gate, the primary access for South Base. Further west, at the terminus of SR 246, is the Coast Gate, which is closed to the public but is occasionally opened for South Base operational activities.

On VAFB, roads are categorized as highways, primary, local (secondary roads), and patrol (VAFB 2007). Primary roads are divided, serve large volumes of traffic, and provide limited access to adjacent land uses. They act as the main circulation routes into and through the cantonment areas and connect to local streets. Local streets provide for traffic movement between primary roads and access roads and provide access to community facilities, parking lots, and housing and service areas. They make up the majority of the road network in the cantonment area and have frequent traffic stops and low speeds. Patrol roads are remote roads that are paved or unpaved and are used for security patrol and monitoring of infrastructure. (VAFB 2007)

Existing roadway conditions are evaluated based on roadway capacity and traffic volume. The capacity, which reflects the ability of the network to serve the traffic demand of a roadway, depends on the roadway width, number of lanes, intersection control, and other physical factors. A road's ability to accommodate different volumes of traffic is generally expressed in terms of Level of Service (LOS). The LOS scales ranges from A to F, with each level defined by a range of traffic volume to roadway capacity (V/C). LOS A, B, and C are considered good operating conditions with minor to tolerable delays experienced by motorists. LOS C is the target for urban highways where most experienced drivers are comfortable, roads are safe but efficiently close to capacity, and posted speed is maintained. LOS D represents below-average conditions. LOS E reflects a roadway at maximum capacity, and LOS F represents traffic congestion.

A 2001 traffic study conducted by Higgins Associates analyzed the transportation and circulation system of VAFB. Items included in the analyses included conditions of roadways, parking facilities, bicycle and pedestrian paths, design, and safety issues. The study then evaluated transportation system capacity and needs. Traffic volume counts at 22 key intersections within the cantonment area were collected and parking demand and capacity was surveyed at eight parking lots. LOS was determined based on existing conditions at the time (2000), along with future (2010) conditions. The study concluded that most

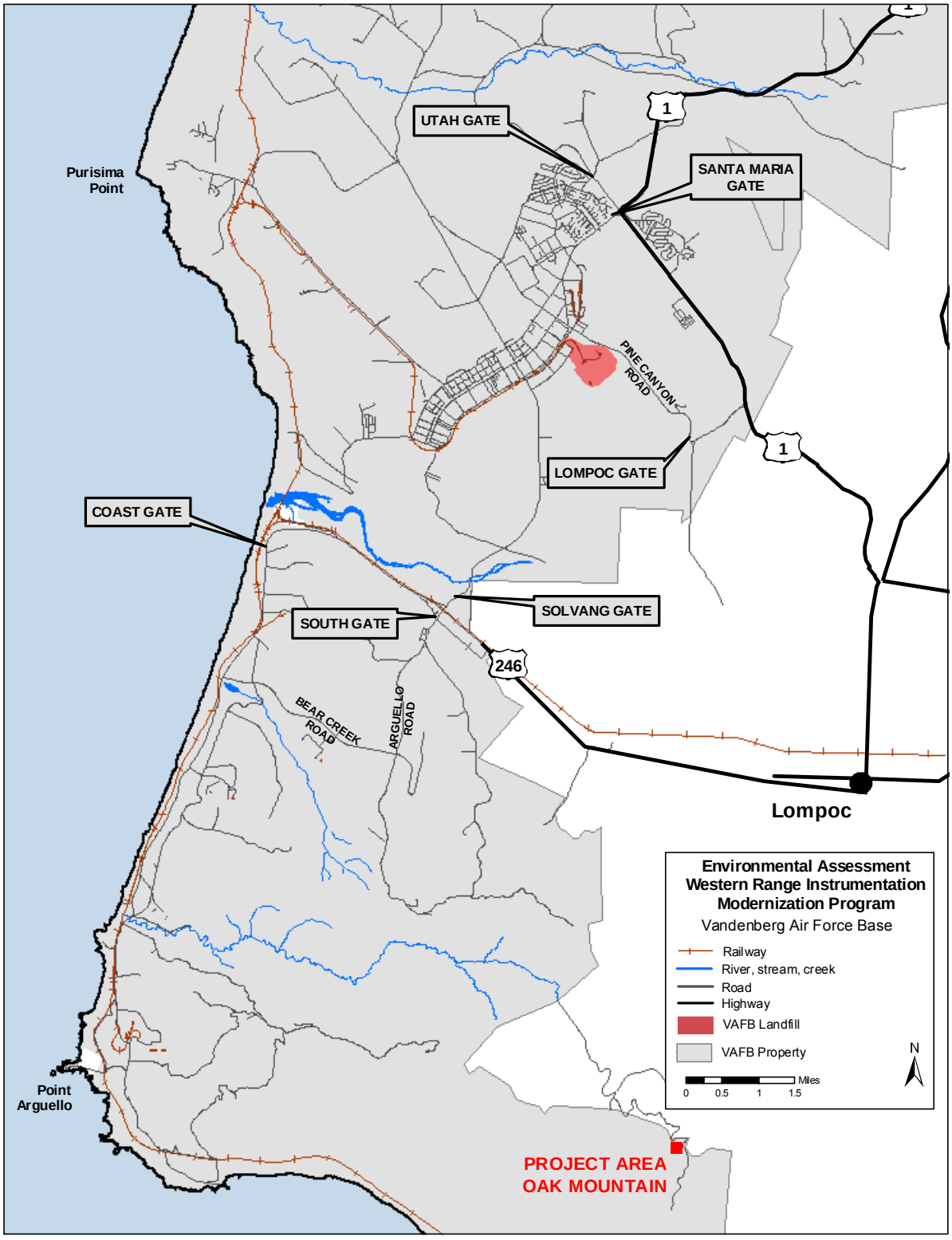

Figure 3.2: Entry gates to VAFB.

intersections would operate at or better than the acceptable standard of LOS C under future conditions.

The Proposed Action would entail worker commuting and construction truck traffic off-Base. For the purposes of this EA, the affected environment as it relates to transportation, would consist of: local major highways/roads off-Base connecting to Santa Maria and Lompoc, including U.S. 1 and SR 246; those primary and local roadways on VAFB that service project areas; and routes between project areas and the VAFB Landfill. It is estimated that worker commuting would be approximately 40 miles round trip per day, and construction truck (dump truck) would be 90 miles per day.

The primary access point for large vehicle traffic to north VAFB is through the Lompoc Gate. Primary roads leading to the VAFB Landfill on north VAFB are Pine Canyon Road and Iceland Avenue. On south VAFB the primary roads include Arguello Road, Bear Creek Road and Coast Road.

3.7.2 PPAFS and Vicinity

PPAFS is situated on a peninsula of land at the north end of Half Moon Bay 0.3 mile due west of the town of Princeton-by-the-Sea on the east side of Princeton Marsh (Figure 1.2). Pillar Point Harbor, a popular sailing area and commercial fishing port, is located on the east side of PPAFS enclosed by two rock jetties. The El Granada Mobile Home Park and the Half Moon Bay Airport are due north of the Station. Other nearby communities include Montara, Moss Beach and Seal Cove (north of the airport), El Granada (east of Princeton-by-the-Sea), and Miramar and Half Moon Bay (southeast of Pillar Point Harbor). West Point Avenue is the only access road to PPAFS. Within PPAFS, one major road (Loop Road) services the main cantonment area where the Proposed Action would occur.

The Proposed Action would entail worker commuting (approximately 40 miles per day) and construction truck traffic (approximately 90 miles per day) outside of PPAFS. For the purposes of this EA, the affected environment as it relates to transportation would consist of local major roads connecting to Princeton, El Granada, Miramar, and Half Moon Bay.

3.8 Water Resources

In California, the State Water Resources Control Board (SWRCB) and the RWQCB administer the Clean Water Act (CWA) and state water regulations. The CWA defines the standards for water quality and mandates that treated water discharged to surface water or to the ocean are subject to the requirements of a National Pollutant Discharge Elimination System (NPDES) Construction General Permit. The NPDES Construction General Permit for construction activities ensures that water discharged from a site meets water quality standards at the point of discharge. The RWQCB is responsible for management of the NPDES permit process for California. The Central Coast RWQCB is the local agency responsible for the VAFB area. The San Francisco RWQCB is the local agency responsible for the PPAFS area.

The California Porter-Cologne Water Quality Act provides a framework for establishing beneficial uses of water resources and the development of local water quality objectives to protect these beneficial uses. State regulations require a WDR for permitting discharge. A Report of Waste Discharge (RWD) (similar to an NPDES permit application) is required for actions that will involve discharge of waste to surface and/or groundwater. The California Porter-Cologne Water Quality Act implements the NPDES program for the state.

The general storm water rainy season at VAFB is from 1 October to 15 April. This timeframe has the greatest potential of construction site pollutant runoff. The average annual rainfall is approximately 14.7 inches (unpublished data, 30 SW).

3.8.1 Water Resources on VAFB

3.8.1.1 Surface Water and Floodplains

The major freshwater resources of the VAFB region include six streams, comprising two major and four minor drainages. The major drainages are San Antonio Creek and the Santa Ynez River. The minor drainages include Shuman, Bear, Cañada Honda, and Jalama Creeks. Aquifers capable of yielding large quantities of water usable for water supply are generally restricted to the deeper portions of the Santa Ynez River and San Antonio Creek (VAFB 1998).

Watersheds are subject to on-Base construction and agricultural runoff. San Antonio Creek, Santa Ynez River, and Shuman Creek also receive off-Base agricultural runoff resulting in elevated dissolved solids, phosphates, and nitrates. Surface water is not directly used as a potable water supply at VAFB. Ambient water quality sampling is performed by the Air Force. 30 SWP 32-7041-C, *Storm Water Management Plan*, contains best management practices (BMPs) for six minimum control measures, two of which are construction related.

3.8.1.2 Groundwater

VAFB includes parts of two major groundwater basins, and at least two subbasins. Most of the northern third of the Base is within the San Antonio Creek Basin, while most of the southern two-thirds of the Base are within the Santa Ynez River Basin and associated Lompoc Terrace and Cañada Honda subbasins. The Proposed Action on VAFB would occur within the Cañada Honda subbasin. This subbasin is relatively small and is bound to the north and south by the drainage divides to Cañada Honda Creek.

Groundwater quality in the region meets all National Primary Drinking Water Regulation standards (VAFB 1989). Continued overdraft of the groundwater basins could lead to degradation in the water table levels and a compaction of the basins. A slight decrease in water quality has been occurring in the region due to the use of water for irrigation. As this water flows through the soil back to the basin, it entrains salts and leads to a buildup of salts in the groundwater (VAFB 1989). Groundwater monitoring is conducted for basins that are used for drinking water. Water in the San Antonio Valley Creek groundwater basin exceeds drinking water standards for total dissolved solids, manganese, and iron. Groundwater is used about one to three weeks per year, while maintenance is being performed on the state water line. However, groundwater is treated prior to its usage as potable water.

3.8.2 Water Resources on PPAFS

3.8.2.1 Surface Water and Floodplains

PPAFS receives an average annual rainfall of 23.43 inches, with the greatest amount of precipitation occurring between the months of December and March (SAIC 1994).

Denniston Creek flows through the coastal plain east of PPAFS and discharges approximately 0.75 mile northeast of the station, into Pillar Point Harbor. Denniston Creek Reservoir is approximately 1.5 miles northeast and upgradient of PPAFS. Pillarcitos Lake and Dam are located approximately 4.75 miles northeast of the station.

The 100-year floodplain is located in low-lying areas northwest of the site, such as Princeton Marsh. PPAFS, at an elevation ranging from approximately 80 to 180 feet above msl, is not within the 100-year floodplain.

Surface water runoff at PPAFS either dissipates into site soils or flows over the cliff edge and onto the beach below. From the beach, storm water infiltrates into the permeable beach sand or discharges to the Pacific Ocean.

3.8.2.2 Groundwater

PPAFS is an uplifted block of land located west of the north/south trending San Gregorio, which isolates PPAFS from inland groundwater basins to the east (ITT 1994).

The nearest private and municipal wells are located in the community of Princeton-by-the-Sea and the Half Moon Bay Airport. These wells draw groundwater from the Denniston Creek/Pillar Point Groundwater Basin.

Although there are private and municipal wells located to the east, water-bearing formations have not been encountered beneath PPAFS. During summer 1998, four bucket-auger drill holes were installed at PPAFS. Seepage was encountered in two of the borings, ranging in depth from 41 ft below ground surface (bgs) to 114 ft bgs (Fugro West Inc [Fugro] 1998).

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Chapter 4. Environmental Consequences

This chapter presents the results of the analysis of potential environmental effects of implementing the Proposed Action and the No-Action Alternative as described in Chapter 2. The vast majority of potential impacts are associated with construction activities and are discussed in detail in each of the sections below; operational impacts would be limited to RF radiation hazards directly associated to wildlife species and human health and safety. Therefore, potential operational impacts are only addressed under Section 4.2, Biological Resources, and Section 4.5, Human Health and Safety.

4.1 Air Quality

As indicated previously, in Santa Barbara County, the SBCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. In San Mateo County, the BAAQMD is the agency responsible for administering air quality regulations. Included in the local air districts' tasks are monitoring of air pollution, maintenance of air quality standards through programs to control air pollutant emissions, and the promulgation of Rules and Regulations.

SBCAPCD and BAAQMD regulations require that facilities building, altering, or replacing stationary equipment that may emit air pollutants obtain an Authority to Construct permit. Further, SBCAPCD and BAAQMD regulations require stationary sources of air pollutants to obtain a Permit to Operate. The local air districts are responsible for the review of applications and for the approval and issuance of these permits. In addition, the SBCAPCD regulations require stationary sources that would emit 25 tons/yr or more of any pollutant except CO in any calendar year during construction to obtain emission offsets. The BAAQMD does not have a similar regulation applying to construction activities; however, the BAAQMD requires implementation of fugitive dust control measures such as watering active construction sites a minimum of twice daily and utilization of best management practices to reduce dust.

Potential impacts to air quality from WR IMP activities could result from construction emissions associated with the program. The analysis involves estimating emissions generated from the proposed activities and assessing potential impacts on air quality.

Potential impacts were evaluated based on calculated direct and indirect emissions associated with implementation of the Proposed Action and the No Action Alternative. Emissions associated with implementation of the proposed action would be confined to construction emissions, as no increase in emissions is associated with operation of the WR instrumentation. Significant air quality impacts would occur if implementation of any of the alternatives would directly or indirectly:

- expose people to localized (as opposed to regional) air pollutant concentrations that violate state or federal ambient air quality standards;
- cause a net increase in pollutant or pollutant precursor emissions that exceeds relevant emission significance thresholds (such as the numerical values of major source thresholds for nonattainment pollutants); or
- conflict with adopted air quality management plan policies or programs.

Criteria to determine the significance of air quality impacts are based on federal, state, and local air pollution standards and regulations. The SBCAPCD has not

established criteria for assessing the significance of air quality impacts for NEPA purposes. Under APCD Rule 202 F.3, if the combined emissions from all construction equipment used to construct a stationary source (which requires an Authority to Construct), have the potential to exceed 25 tons of any pollutant (except carbon monoxide) in a 12-month period, the owner of the stationary source shall provide offsets under the provisions of Rule 804 and shall demonstrate that no ambient air quality standard would be violated. Standard dust control measures must be implemented for any discretionary project involving earth-moving activities. Some projects have the potential for construction-related dust to cause a nuisance. Since Santa Barbara County violates the state standard for PM_{10}, dust mitigation measures are required for all discretionary construction activities regardless of the significance of the fugitive dust impacts based on the policies in the 1979 Air Quality Attainment Plan.

To determine the significance of operational impacts, Santa Barbara County guidelines state that if a project would have emissions greater than the offset trigger set forth in the New Source Review Rule (Applies to sources/modifications with post-1990 emissions of: 80 pounds per day (lbs/day) or 15 tons/yr of PM_{10}, 150 lbs/day or 25 tons/yr of CO, or 55 lbs/day or 10 tons/yr of any other nonattainment pollutant), the project would have a significant impact on the ambient air quality. For purposes of this air quality analysis, project emissions within the VAFB region would be potentially significant if they exceed these thresholds. This is a conservative approach, as the analysis compares emissions from both project-related stationary and mobile sources to these thresholds.

The BAAQMD does not set thresholds of significance for construction projects; however, for operational emissions they consider emissions of 15 tons/yr as a significance threshold for nonattainment pollutants (ROG, NOx, and PM_{10}). For attainment pollutants, the major source threshold of 100 tons/yr can be used to evaluate whether a project's emissions would be significant.

If emissions exceed a significance threshold described above, further analysis of the emissions and their consequences would be performed to assess whether there was likelihood of a significant impact to air quality. The nature and extent of such analysis would depend on the specific circumstances. The analysis could range from simply a more detailed and precise examination of the likely emitting activities and equipment, to air dispersion modeling analyses. If proposed action emissions were determined to increase ambient pollutant levels from below to above a national or state ambient air quality standard, these emissions would be significant.

4.1.1 Proposed Action (Alternative A)

The Proposed Action consists of the construction and installation of new TM and CT sites, including antennas and antenna domes, and the upgrade/modernization of supporting facilities to meet the needs of these modernizations to instrumentation and equipment. Air quality impacts from proposed construction activities would occur from (1) combustion emissions due to the use of fossil fuel-powered equipment and (2) fugitive dust emissions (PM_{10} and $PM_{2.5}$) during earth-moving activities, and materials handling.

Factors needed to derive construction source emission rates were obtained from *Compilation of Air Pollution Emission Factors, AP-42, Volume I* (U.S. EPA 2002), the South Coast Air Quality Management District's (SCAQMD) California Environmental Quality Act (CEQA) Air Quality Handbook (SCAQMD 1999), the CARB's OFFROAD emission factors from the OFFROAD2007 Model (CARB 2007b), and the EMFAC2007 (CARB 2007c) model.

Construction scenarios for the proposed WR IMP were provided by the Air Force. Proposed construction activities are assumed to occur during calendar year 2008 through 2010. In addition to construction emissions

from on-site equipment use and fugitive dust, emissions from construction workers commuting to and from the construction sites, and emissions associated with trucks hauling material from the construction sites to various disposal sites were calculated using emission factors from the CARB's EMFAC2007. Equipment emissions factors, estimates of workforce requirements, and haul truck travel are provided in Appendix B, along with the emission calculations for construction activities. Construction emissions are summarized in Table 4.1. As shown, emissions would not exceed the significance thresholds for any criteria pollutant.

Based on the air quality analysis for the Proposed Action at PPAFS, within the BAAB, the maximum estimated emissions would be below conformity *de minimis* levels and would be less than 10 percent of projected regional emissions (Table 4.2). Therefore, a conformity determination with California's SIP would not be necessary.

4.1.2 Environmental Protection and Monitoring Measures

All activities under the Proposed Action would comply with applicable district-specific prohibitory rules relating to architectural coatings, adhesives, sealants, and others. Before construction begins for any project covered under the Proposed Action, portable equipment meeting the criteria defined in the *Final Regulation Order,* effective September 12, 2007 for the California Portable Equipment Registration Program (PERP) would be registered in the program or have a

Table 4.1. Proposed Action (Alternative A) construction emissions (tons).

	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$
FY 2008 - PPAFS						
Heavy Construction Equipment	0.45	0.12	1.18	0.00	0.08	0.07
Construction Worker Travel	0.71	1.52	0.22	0.00	0.09	0.09
Haul Trucks	0.30	0.03	0.02	0.00	0.00	0.00
Fugitive Dust					0.08	0.02
Total FY 2008	***1.46***	***1.67***	***1.42***	***0.00***	***0.26***	***0.18***
Significance threshold	100	15	15	100	15	15
Exceeds threshold?	No	No	No	No	No	No
FY 2009 - VAFB						
Heavy Construction Equipment	0.34	0.10	0.90	0.00	0.06	0.05
Construction Worker Travel	1.02	1.45	0.24	0.00	0.09	0.09
Haul Trucks	0.30	0.03	0.02	0.00	0.00	0.00
Fugitive Dust					0.05	0.01
Total FY 2009	***1.66***	***1.58***	***1.15***	***0.00***	***0.20***	***0.15***
Significance threshold	25	10	10	10	15	10
Exceeds threshold?	No	No	No	No	No	No
FY 2010 - PPAFS						
Heavy Construction Equipment	0.45	0.12	1.18	0.00	0.08	0.07
Construction Worker Travel	1.15	1.69	0.29	0.00	0.11	0.11
Haul Trucks	0.28	0.03	0.02	0.00	0.00	0.00
Fugitive Dust					0.08	0.02
Total FY 2010	***1.88***	***1.84***	***1.48***	***0.00***	***0.27***	***0.20***
Significance threshold	25	10	10	10	15	10
Exceeds threshold?	No	No	No	No	No	No

Table 4.2. Estimated total net project emissions (tons/year) at PPAFS.

Calendar Year	Pollutant	
	VOC	NOx
2008	1.58	1.15
2010	1.46	1.46
General Conformity *De minimis* Thresholds	100	100
Exceed threshold?	No	No
Bay Area Air Basin estimated emissions for 2006(1)	134,758	179,580

(1) Emissions for year 2006 are from California Air Resources Board emissions inventory website.

valid Permit to Operate from SBCAPCD, for VAFB; or BAAQMD, for PPAFS. In addition, portable diesel equipment would comply with the *Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines rated at 50 horsepower and Greater* dated September 12, 2007.

Equipment usage would be reported to 30 CES/CEV to facilitate tracking construction emissions for inclusion in the VAFB Air Emissions Inventory. The following measures would be implemented to further decrease fugitive dust emissions from ground disturbing activities:

- Water – preferably reclaimed – would be applied at least twice daily to dirt roads, graded areas, and dirt stockpiles to prevent excessive dust at the staging areas. Watering frequency would be increased whenever the wind speed exceeds 15 miles per hour. Chlorinated water would not be allowed to run into any waterway.
- Vehicle speeds would be minimized on exposed earth.
- Ground disturbance would be limited to the smallest practical area and to the least amount of time.
- Personnel would be designated to monitor project activities to ensure that excessive dust is not generated at demolition sites.
- The Storm Water Pollution Prevention Plan (SWPPP) – including BMPs to reduce dust emissions - and the contractor's Environmental Protection Plan (EPP), which includes dust control compliance measures, would be complied with.
- If importation, exportation, and stockpiling of fill material are involved, soil stockpiled for more than two days would be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site would be tarped from the point of origin.

In addition to the above dust control measures, the following control measures would be implemented to decrease diesel emissions. Diesel engines operated in California are required to meet CARB established standards which may be more stringent than federal mandates.

- When applicable, equipment powered with federally mandated ultra-low sulfur diesel engines would be used.
- Engine size in equipment used for the project would be minimized.
- The use of equipment would be managed to minimize the number of pieces of equipment operating simultaneously and total operation time for the project.
- Engines would be maintained in tune per manufacturer or operator specification.
- CARB certified diesel fuel would be used.
- If applicable, U.S. EPA or CARB-certified diesel catalytic converters, diesel oxidation

catalysts, and diesel particulate filters would be installed.

- CARB-developed idling regulations for trucks during loading and unloading would be followed.
- When applicable, equipment powered by diesel engines retrofitted or re-engined to meet the Air Toxics Control Measures for Off-Road Vehicles would be used.
- A Notification for Renovation and Demolition would be submitted to the SBCAPCD for planned demolition activities that would occur on VAFB.
- A Demolition, Regulation 11, Rule 2, Notification Form would be submitted to the BAAQMD for planned demolition activities on PPAFS.

Given the requirements of EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, and the increasing concerns that greenhouse gases contribute to Global Climate Change, the 30 CES/CEV will take into consideration and encourage measures that promote efficiency and conservation through education, programs, and incentives to increase efficiency and conserve energy in projects on VAFB.

4.1.3 Alternative B: No-Action Alternative

Under the No Action Alternative, the WR IMP would not proceed. No air emissions would be associated with the No-Action Alternative; however, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.2 Biological Resources

4.2.1 Proposed Action (Alternative A)

Potential impacts to vegetation types and plant and wildlife species from the Proposed Action include:

- Short-term (temporary) and long-term (permanent) loss of habitat from construction related activities such as access, and excavation.
- Loss of individuals within the work area due to excavation, crushing or burial.
- Loss of individual plants and wildlife in habitats adjacent to work areas due to soil erosion.
- Abandonment of breeding and/or roosting sites due to project related noise and associated disturbance.
- Disruption of foraging or roosting activities due to project related noise and associated disturbance.
- Soil erosion in wetlands or open water adjacent to the project site.

Providing instrumentation support to the proposed upgrades at PPAFS from Building 10 would not alter the footprint of the project area and would only result in a shorter trench for installation of communications and power supply. Opting for replacing the GRK-7 antenna rather than the ATTAS antenna at Oak Mountain on VAFB, would also not represent significant differences in the effects on natural resources. Thus, the analysis of environmental consequences provided below would also apply if one or both of these options were chosen as part of the Proposed Action.

4.2.1.1 Botanical Resources

The vegetation types that occur within the footprints of the project areas at VAFB and PPAFS are predominantly mowed non-native grasslands dominated by low growing annual forbs and grasses, most of which are introduced. On PPAFS, some native shrubs are intermixed with the non-native grassland, which is also contains patches of non-native, invasive iceplant. Removal of vegetation for construction of service roads and installation of equipment would not result in any significant adverse effects to botanical resources.

Non-native invasive species occur within project areas under the Proposed Action. To prevent the introduction and spread of

invasive plant species, all construction equipment would be inspected to ensure it is free of vegetative material prior to its arrival at any of the work sites, and after completion of construction work prior to its removal. Vegetation that is removed from any of the work areas would be collected and disposed of at an appropriate disposal site.

4.2.1.2 Wildlife Resources

Wildlife, including mammals, amphibians, reptiles, and birds, present in the vicinity of the construction activities could be affected by construction noise and human disturbance. The removal of vegetation would cause the loss of habitat for some species, which would have to seek alternate cover, adding to the disturbance. These disturbances would be considered short-term and temporary and would not result in adverse impacts to populations with the vicinity of project areas.

The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712), provides federal protection to native avian species, their nests, eggs, and unfledged young. Construction activities associated with proposed projects would result in short-term noise disturbances, which may temporarily disrupt foraging and roosting activities of individual birds. In addition, if the construction occurs during the breeding season for avian species, it has the potential to disrupt breeding activities including courtship, incubation and brooding. Avian surveys immediately preceding the initiation of construction activities scheduled to occur between March and August would identify the presence of any nests in the vicinity of the project area.

Implementing the environmental protection and monitoring measures described in Section 4.2.2 should avert adverse effects on wildlife resources.

4.2.1.3 Sensitive Vegetation Types and Special Status Species

Field surveys did not document the presence of sensitive vegetation types or special status species within the project areas at VAFB or PPAFS.

4.2.1.4 RF Hazards to Wildlife Species

As discussed in Section 4.5 (Human Health and Safety), potential for RF energy emission hazards exist in a specified area that occurs within 10º of the beam of CT antennas, and azimuths in the sector between 153 and 301º. While human health and safety standards for maximum exposure levels have been established and are adhered to by the Air Force (AFOSH Standard 48-9), no such standards exist with regards to wildlife species. However, the area where RF energy emission of CT antennas has the potential to affect humans and wildlife is a minimum of 12 ft above ground (see Table 3.8) with maximum emissions resulting between 120 and 260 ft from the antennas, and heights between approximately 18 and 26 ft. Wildlife that may be exposed to this RF hazard would have to be airborne; thus, only avian species have the potential to be affected. In addition, the CT antennas would only be active for approximately eight hours during launch events, currently estimated to be 15 launches annual through 2012, with an additional 6 hours for extended operations. Given that avian species would be flying through these affected areas during periods of time when RF energy is emitted, their exposure time would be minimal (the AFOSH Standard for humans addresses RF hazards for exposure times of 6 and 30 minutes). As a result, the potential for these wildlife species to be adversely affected would be minimal if any.

4.2.2 Environmental Protection and Monitoring Measures

Implementing the following measures should avoid or minimize potential adverse effects to biological resources during the construction phase of the project. No adverse effects to natural resources are anticipated during the operational phase.

- Staff biologists will survey the construction sites prior to activity to determine if protected wildlife and bird species would

be affected, requiring implementation of measures such as temporary work stoppage or translocation.

- Removal of native vegetation and plants would be minimized to the greatest extent possible.
- Vehicle access and staging would be restricted to paved surfaces and the designated staging area.
- To minimize the potential for wildlife entrapment, trenches and holes would not be left open overnight, whenever possible.
- Trenches or segments of trenches and holes that must be left open at the end of the workday would be ramped at a 45º angle or less to minimize the potential for entrapment of wildlife.
- BMPs to reduce the spread of invasive plant species during and after construction would be implemented.

4.2.3 Alternative B: No-Action Alternative

Under the No-Action Alternative, no construction would occur and, therefore, biological resources would not be affected at either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.3 Cultural Resources

4.3.1 Proposed Action (Alternative A)

Archaeological surveys found no evidence of prehistoric or historical resources in the areas to be affected by the proposed work at any of the WR IMP project locations. At Oak Mountain on VAFB, two facilities that have been evaluated as eligible to the NRHP would be affected. Facility 81, the 35-foot ATTAS antenna, will be demolished and replaced and Building 75, the control center, will have new equipment installed. Both of these are considered NRHP-eligible as a result of their continuing contribution to exceptionally important Cold War missions.

The Advisory Council on Historic Preservation (ACHP) 1991 publication, *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities*, provides guidance for properties that are of historic significance but that are still active operational facilities engaged in programs supporting scientific or defense related missions. These facilities are considered significant because of their historic function rather than their architectural or engineering design and so integrity of function is considered important to their eligibility. The HPP for Cold War properties notes that upgrades and other necessary modifications that do not compromise a significant facility's ability to convey a sense of that role, do not require formal Section 106 consultation. However, in the context of the WRLISSHD, the HPP indicates, "Undertakings that adversely affect the ability of a site's contributing elements to convey a sense of the site's historic function will require VAFB to complete the statutory Section 106 process. This would occur, for example, when contributing elements are completely removed or replaced, when an entire site is demolished, or when a site is altered to perform a function wholly unrelated to its historic function."

Both of the significant Oak Mountain facilities that are part of the WR IMP were identified as eligible for the NRHP based on their function. Thus, replacement of the 35-foot ATTAS antenna system, and upgrades to internal equipment at Building 75, may not be considered an adverse effect because they will continue to function in the same role, and convey the sense of the role after the upgrades. However, because the antenna is to be decommissioned and replaced, VAFB completed a Section 106 consultation on the eligible Cold War facilities on July 22, 2008. VAFB completed a Native American consultation regarding the Proposed Action and alternatives described in this EA. The Air Force will notify the Santa Ynez Band of Chumash Indians before construction commences on VAFB to schedule a Native American monitor in sensitive cultural areas.

At PPAFS, three facilities were determined eligible for their contribution to exceptionally important Cold War programs. The proposed WR IMP, however, would not affect any of these facilities. New antennas are to be installed on unoccupied locations, and Building 9, which is to be demolished, was not identified as eligible for the NRHP.

4.3.2 Environmental Protection and Monitoring Measures

The Proposed Action would comply with Section 106 of the NHPA and with AFI 32-7065, *Cultural Resources Management*. In the event that previously undocumented cultural resources are discovered during construction activities, procedures established in 36 CFR 800.13 and the VAFB Integrated Cultural Resources Management Plan would be followed.

Three of the facilities at Oak Mountain (Facility 81, 35' ATTS antenna; Building 75, Control Center; and Facility 86, GKR-7 antenna) were determined eligible for the NRHP because of their continuing contribution to exceptionally important Cold War missions. However, their eligibility is based on their function and thus replacement and upgrades may not be considered an adverse effect because they will continue to function in the same role after the upgrades. VAFB obtained concurrence from the SHPO with a no-adverse-effect determination due to upgrades planned on historic Cold War properties at Oak Mountain, on VAFB. As such, the Proposed Action is compliant with Section 106 of the NHPA. VAFB also completed a Native American information consultation with the Chumash Indians regarding the Proposed Action. The Air Force will notify the Santa Ynez Band of Chumash Indians before construction commences on VAFB to schedule a Native American monitor in sensitive cultural areas.

4.3.3 Alternative B: No-Action Alternative

Under the No-Action Alternative, no construction would occur and, therefore, cultural resources would not be affected at either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.4 Hazardous Materials and Hazardous Waste Management

Potential impacts as a result of hazardous materials and hazardous waste are evaluated using federal, state, and local regulatory requirements, contract specifications, and Base operating constraints. Hazardous materials management requirements are found in federal and state EPA and OSHA regulations, contract specifications and the VAFB *Hazardous Materials Management Plan* (30 SWP 32-7086). Hazardous waste management requirements are found in federal, state, and local regulations, contract specifications and the VAFB *Hazardous Waste Management Plan* (30 SWP 32-7043A). Non-compliance with applicable regulatory or permitting requirements, human exposure to hazardous materials and wastes above permitted human health safety limits, or an environmental release above permitted limits, would be considered adverse impacts.

4.4.1 Proposed Action (Alternative A)

Potential adverse effects related to hazardous materials and hazardous waste management could result from construction activities under the Proposed Action. During the operational phase, potential adverse effects would be associated with the installation of generators and oil storage tanks. Secondary containment for these units would be installed during construction to prevent accidental spills into the environment.

The construction contractor would be subject to hazardous materials and waste management regulations as required by federal, state and local laws and regulations, and procedures as outlined in the VAFB *Hazardous Materials Management Plan* (30 SWP 32-7086) and VAFB *Hazardous Waste Management Plan* (30 SWP 32-7043A). Compliance with all applicable

federal, state and local regulations, rules and requirements, and applicable VAFB plans, would govern all actions associated with implementing the Proposed Action, and would minimize the potential for adverse effects.

Construction activities under the Proposed Action would require the use of hazardous materials commonly used for construction and demolition projects, and would be the same types as currently used and managed on VAFB and PPAFS. Because the Proposed Action would be spread over 24 months and a small number of workers (four) would be working at any one time, there would not be a significant increase in the amounts of hazardous materials present on VAFB or PPAFS. Thus, no significant adverse effects are anticipated.

Potential adverse effects could result from accidental releases of POLs from vehicle and equipment leaks. All hazardous wastes would be properly managed and disposed of in accordance with applicable federal, state, and local hazardous waste regulations, and the VAFB *Hazardous Waste Management Plan* (30 SWP 32-7043A). All hazardous wastes would be managed either during release response and cleanup, or during abatement removal actions.

4.4.1.1 Asbestos Abatement Management

In addition to the regulations described above for hazardous materials and waste management, the evaluation of potential impacts associated with the presence of ACM also includes disposal requirements, particularly as applied to the disposal of non-friable asbestos in the VAFB Landfill. The VAFB Asbestos Management Plan (30 SWP 32-1052A) and local SBCAPCD and BAAQMD rules, as applicable to National Emissions Standards for Hazardous Air Pollutants (NESHAPS) for asbestos, would also be criteria for assessing asbestos survey, abatement, management, and disposal actions. Non-compliance with applicable regulatory requirements, human exposure to ACM, or environmental release above permitted limits, would be considered adverse impacts.

The contractor would prepare site specific Asbestos Work Plan for abatement of ACM, and submit to 30 CES/CEV for review prior to renovation and/or demolition. The BAAQMD requires a 10-day notification period prior to any ACM abatement, demolitions, or renovations. Notifications must be forwarded to 30 CES/CEV for counter-signature prior to submitting to the BAAQMD.

All ACM would be abated prior to demolition. Personal protective clothing and equipment are necessary to protect workers against asbestos hazards that may be encountered at abatement sites. Friable asbestos waste generated by the demolition contractor would be disposed of following hazardous waste management procedures, wherein the contractor obtains the appropriate container or portable disposal unit and provides 30 CES/CEV Compliance Office 48-hour notice to approve the manifest to a certified landfill. Friable asbestos that has been sampled, analyzed, and characterized as hazardous waste would be transported and disposed of by approved, permitted contractors. Non-friable asbestos may be disposed of at the VAFB Landfill, provided contract specifications allow it, and the contractor follows requirements and procedures as found in the VAFB *Solid Waste Management Plan* (30 SWP 32-7042). Implementing these measures should ensure no adverse effects result from ACM.

4.4.1.2 Lead-Based Paint Management

In addition to the regulations described above for hazardous materials and waste management, the evaluation of potential impacts as a result of LBP containing materials also includes the VAFB *Lead Based Paint Management Plan* (30 SWP 32-1002) and applicable local SBCAPCD and BAAQMD rules. These regulations, rules, and the VAFB *Lead Based Paint Management Plan* (30 SWP 32-1002) would also be criteria for assessing LBP survey, abatement, management and disposal

actions. Non-compliance with applicable regulatory requirements, human exposure to LBP containing materials, or environmental release above permitted limits, would be considered adverse impacts.

The contractor would prepare site specific Written Compliance Plan for the stabilization or removal of LBP and submit it to 30 CES/CEV for review prior to any renovation and/or demolition. The contractor for demolition activities would sample all buildings proposed for demolition for lead content. Personnel performing demolition activities would be trained to recognize hazards and protect themselves and others from lead exposure. LBP abatement would be accomplished prior to structural demolition. Proper segregation of demolition debris would be used to avoid unnecessary contamination due to LBP. Wastes that are hazardous due to metals (lead) toxicity would be processed following regulatory requirements and Air Force procedures for eventual offsite disposal. Wastes that may contain LBP, have been analyzed, and are determined to be non-hazardous, may be disposed of in approved landfills, provided federal and state regulatory conditions have been met; disposal in the VAFB Landfill must also meet the requirements of the VAFB *Solid Waste Management Plan*, 30 SWP 32-7042. Implementing these measures should ensure no adverse effects result from LBP containing materials.

4.4.1.3 Polychlorinated Biphenyls and Dioxins

The regulations described above for hazardous materials and waste management are used to evaluate potential impacts as a result of PCB and dioxin containing materials. These regulations, rules, and VAFB plans would also be criteria for assessing PCB and dioxin survey, abatement, management, and disposal actions. Non-compliance with applicable regulatory requirements, human exposure to PCB and dioxin containing materials, or environmental release above permitted limits, would be considered adverse impacts.

Any building proposed for demolition would be surveyed for PCBs in oils, coatings, and electrical devices. Devices or wastes containing PCBs and mercury would be managed in accordance with federal, state, and local environmental regulations. Should any transformer be removed, the removal action would be coordinated with the 30 CES Utilities Electrical Shop to account for removal, and to verify PCB presence or content in the removed transformer. Implementing these measures should ensure no adverse effects result from PCB and dioxin containing materials.

4.4.1.4 Installation Restoration Program

Potential IRP impacts are evaluated using DoD and Air Force guidance, and the FFSRA, as negotiated between VAFB and the regulatory agencies with oversight of VAFB IRP activities. Non-compliance with the FFSRA, human exposure to contaminants, or environmental release above permitted limits, would be considered adverse impacts.

Because project activities at PPAFS would occur within the boundary of an AOC that is currently under investigation, there is the potential for encountering pollutants during project implementation, as well as inadvertent interaction with IRP equipment and operations. The potential for contact with contaminants considered a risk to human health is unknown at this time. To avoid adverse effects and exposure of workers to contamination, coordination with the 30 CES/CEV IRP Office would be required prior to the start of any construction activities under the Proposed Action.

4.4.2 Environmental Protection and Monitoring Measures

Potential adverse impacts to the environment associated with hazardous materials and waste management should be minimized through strict compliance with all applicable federal and state statutes and regulations, local support plans and instructions including 30 SWP 32-7086, *Hazardous Materials Management Plan*; 30 SWP 32-7043A,

Hazardous Waste Management Plan; 30 SWP 32-1052A, *Asbestos Management Plan*; and 30 SWP 32-1002, *Lead Based Paint Management Plan*. Implementing the measures presented below would further minimize the potential for adverse impacts during the construction phase of the Proposed Action.

- Proper disposal of hazardous waste would be accomplished through identification, characterization, sampling and analysis of wastes generated.
- All hazardous materials would be properly identified and used in accordance with manufacturer's specifications to avoid accidental exposure to or release of hazardous materials required to operate and maintain construction equipment.
- All equipment would be properly maintained and free of leaks during operation. All necessary equipment maintenance and repairs would be performed in pre-designated controlled, paved areas to minimize risks from accidental spillage or release.

For demolition of existing facilities the following measures would also be implemented:

- In compliance with California Business Plan requirements, contractors would submit a Business Plan or Disclaimer based upon amount of hazardous materials present on site for more than 30 days.
- Per VAFB requirements, contractors would submit an EPP to 30 CES/CEV prior to the start of demolition activities.
- A Spill Prevention and Response Plan would be submitted to 30 CES/CEV prior to the start of demolition activities.
- An Asbestos Work Plan for abatement of ACM would be submitted to 30 CES/CEV prior to any demolition activities.
- Notifications to the BAAQMD would be submitted to 30 CES/CEV for counter-signature prior to submitting to the BAAQMD.
- A Written Compliance Plan for the stabilization or removal of LBP must be submitted to 30 CES/CEV for review prior to any proposed renovation and/or demolition.
- The contractor would prepare and forward notifications for the BAAQMD to 30 CES/CEV for counter-signature prior to submitting to the BAAQMD.
- As required, to avoid accidental exposure and ensure proper management of hazardous materials presently managed in-place (asbestos containing material, LBP, polychlorinated biphenyls, and dioxins), hazardous materials surveys and abatements would be accomplished prior to demolition. All personnel performing surveys, abatements and demolition activities would be trained to recognize hazards and protect themselves and others from exposure. Abatement would be completed prior to demolition.
- As required, an Asbestos Work Plan would be prepared by demolition contractors and approved by 30 CES/CEV, Compliance Office.
- As required, all personnel working at abatement sites would wear protective clothing and equipment to protect against hazards that may be encountered.

Because some aspects of construction activities under the Proposed Action would occur within boundaries of AOCs, there is the potential for encountering pollutants during implementation of the Proposed Action. Prior to any project activities at AOC sites, AF Form 332, *Base Civil Engineer Work Request*, and AF Form 103, *Base Civil Engineering Work Clearance Request* coordination with 30 CES/CEV IRP Office would be required. To avoid adverse effects, construction activities associated with the Proposed Action would be coordinated with the 30 CES/CEV IRP Office prior to the start of construction so as not to expose workers to contamination.

4.4.3 Alternative B: No-Action Alternative

Under the No-Action Alternative, construction activities would not occur, therefore there would be no change in the management or levels of hazardous materials and waste on either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.5 Human Health and Safety

4.5.1 Proposed Action (Alternative A)

The contractor would comply with OSHA regulations, and other recognized standards and applicable Air Force regulations or instructions. Restricted public access to the construction sites would be provided through use of signs and fencing. The contractor must also provide for the health and safety of workers and all subcontractors who may be exposed to their operations or services. The contractor must submit a health and safety plan to the Base and appoint a formally trained individual to act as safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of personnel and visitors to the job site. Therefore, general construction hazards would not adversely impact human health and safety.

Biological hazards, including vegetation (i.e., poison oak and stinging nettle), animals (i.e., insects, spiders, and snakes), and disease vectors (i.e., ticks, rodents), exist at and near the proposed project sites, and have the potential to adversely impact the health and safety of construction personnel. Adherence to federal OSHA regulations would minimize the exposure of workers to these hazards.

According to regulations of the federal OSHA, employees should not be subjected to sound exceeding a L_{eq1H} of 90 dB for an eight-hour period. This sound level increases by five dB with each halving of time (e.g., four-hour period at 95 dB). Exposure up to a L_{eq1H} of 115 dB is permitted for a maximum of only 15 minutes during an 8-hour workday and no exposure above 115 dB is permitted. For this analysis, OSHA standards are used as the "not to exceed" criteria as they are the most appropriate standards available.

The Proposed Action would temporarily increase the ambient noise levels within the project area and in neighboring areas during project implementation activities. No residential neighborhoods or other populated areas are present within adjacent areas that may be affected by construction noise. Construction equipment would generate relatively continuous noise. These continuous noise levels are generated from equipment that have source levels (at one meter) ranging from approximately 72.7 to 112.7 dB. As a sound source gets further away, the sound level decreases. This is called the attenuation rate. The rates are highly dependent on the terrain over which the sound is passing and the characteristics of the medium in which it is propagating. The rate used in these estimates was a decrease in level of 4.5 dB per doubling of distance. This average rate has been shown to be an accurate estimate from field data on grassy surfaces (Harris 1998). At 50 meters these levels range from 47.3 to 87.3 dB. Typical noise levels of heavy construction equipment are presented in Table 4.3. Adverse effects as a result of noise are expected to be minimal and less than significant.

RF Transmitter Hazards

Measurements evaluating the VAFB CT-1 antenna RF energy output indicate that individuals would be exposed to uncontrolled levels of 0.28 mW/cm^2 or higher only if they were to be within 10º on either side of the center of the main beam of the antenna and within 120 and 280 ft in front of the antenna (see Figure 3.1 in Chapter 3). In addition, because of the proximity of PPAFS to populated areas, the proposed CT-4A and CT-4B antennas at PPAFS were evaluated to assess the RF hazards resulting during their operation.

Table 4.3: Noise levels of heavy construction equipment.

Equipment Item	Maximum Noise Level (dBA) at 50 feet	Equipment Item	Maximum Noise Level (dBA) at 50 feet
All other equipment > 5 HP	85	Gradall	85
Auger Drill Rig	85	Grader	85
Backhoe	80	Horizontal Boring Hydraulic Jack	80
Bar Bender	80	Insitu Soil Sampling Rig	84
Boring Jack Power Unit	80	Jackhammer	85
Chain Saw	85	Paver	85
Compactor (ground)	80	Pickup Truck	55
Compressor (air)	80	Pneumatic Tools	85
Concrete Batch Plant	83	Pumps	77
Concrete Mixer Truck	85	Rock Drill	85
Concrete Pump	82	Scraper	85
Crane (mobile or stationary)	85	Slurry Plant	78
Dozer	85	Slurry Trenching Machine	82
Dump Truck	84	Soil Mix Drill Rig	80
Excavator	85	Tractor	84
Flat Bed Truck	84	Vacuum Excavator (vac-truck)	85
Front End Loader	80	Vacuum Street Sweeper	80
Generator (25 KVA or less)	70	Vibratory Concrete Mixer	80
Generator (more than 25 KVA)	82	Welder	73

SOURCE: Commonwealth of Massachusetts, Section 721.560 Construction Noise Control – http://www.nonoise.org/resource/construc/bidgid.htm

The figures in Appendix C depict the potential for RF energy hazards resulting from the CT antennas. In summary, RF hazards would not be significant given that the antennas will be designated to any azimuth in the sector between 153 and 301º. The azimuth travel will be mechanically limited to this sector as depicted by the shaded areas for CT-4A and CT-4B in Figure C-1 (Appendix C). The hazard area with the antenna at the azimuth limits is depicted in Figure C-2 (Appendix C). The antennas will be mechanically limited to +2º in elevation. Figures C-3 and C-4 (Appendix C) show the vertical profile of the beam at the lower elevation limit. The controlled areas (where the permissible exposure level is 1.4 mW/cm^2 averaged over a 6-minute period) is contained within the fence for PPAFS, eliminating the potential for the public to be affected. PPAFS personnel could be exposed to RF energy; however, signage and warning lights alerting personnel of the potential hazard when the antennas are activated would be installed, as required by AFOSH Standard 48-9, preventing potential adverse effects on personnel health and safety.

Figures C-3 and C-4 (Appendix C) illustrate the vertical profile of the beam from the antennas at the lower elevation limit. The diagrams illustrate that if the controlled area (shown in red) extends over the cliff to the ocean, the tip of the area would be about 180 ft above sea level, while the tip of the uncontrolled area (shown in blue), would be about 195 ft above sea level. This would be the case for any azimuth in the 153 to 301º degree range. Any person that is present on surrounding beaches or in the water would not be affected given that the beam would be well above them. In summary, it is anticipated that only personnel working within the fence of PPAFS would be subject to potential RF hazards, and these would be averted through the warning light system as required by AFOSH Standard 48-9.

4.5.2 Environmental Protection and Monitoring Measures

Implementing the measures described below should avoid or minimize potential adverse impacts to human health and safety associated with activities under the Proposed Action (construction and operational phase):

- To provide for the health and safety of workers and visitors who may be exposed to construction and demolition operations included under the Proposed Action, contractors would comply with federal OSHA requirements over the entire project. In addition, because California OSHA applies to VAFB property south of Honda Creek, compliance with its requirements on VAFB would also be required.
- Contractors would also supply a health and safety plan to VAFB and appoint a formally trained individual to act as safety officer. Additionally, contractors would coordinate with the Explosive Ordnance Disposal (EOD) Flight prior to implementing the Proposed Action to ensure no adverse effects on human health and safety would occur from unexploded ordnance issues.
- To minimize potential adverse impacts from biological hazards (e.g., snakes and poison oak) and physical hazards (e.g., rocky and slippery surfaces), awareness training would be incorporated into the worker health and safety protocol.
- During the operational phase of the Proposed Action, the Air Force would comply with DoD Instruction 6055.11, *Protection of DoD personnel from Exposure to Radiofrequency Radiation and Military Exempt Lasers*, and AFOSH Standard 48-9, *Radio Frequency Radiation Safety Program*, to prevent possible harmful effects to personnel from exposure to potentially hazardous levels of RFR.

4.5.3 Alternative B: No-Action Alternative

Under the No-Action Alternative, construction activities would not occur, therefore there would be no effects on Human Health and Safety at either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.6 Solid Waste Management

Solid waste impacts are evaluated using federal, state, and local regulatory requirements, landfill and waste discharge permit conditions, contract specifications, and Air Force plans such as 30 SWP 32-7042, *Solid Waste Management Plan*. Adverse impacts would occur from non-compliance with applicable regulatory requirements or an increase in the amount of waste disposed beyond available waste management capacities. Disposal amounts in the VAFB Landfill that would cause the Base to drop below its currently mandated 50 percent diversion rate would be considered an adverse impact. Also at VAFB an adverse impact would result if disposal required use of other Santa Barbara County landfills. At PPAFS adverse impacts would result in disposal that would cause San Mateo County landfills to exceed their diversion rates.

4.6.1 Proposed Action (Alternative A)

4.6.1.1 Construction and Demolition Debris

Solid waste generated during construction projects would include packaging from materials (cardboard and plastic), scrap rebar, wood, pipes, wiring, asphalt, concrete, and miscellaneous waste generated by onsite construction workers. Contractors would be responsible for the disposal and/or recycling of all waste generated during the scope of the project.

All soil excavated during construction activities would be used as backfill, and any excess materials for VAFB projects would be taken to the Nipomo Transfer Station. For projects at PPAFS the Ox Mountain Sanitary Landfill would be used. Asphalt and concrete generated at VAFB would be accepted at the VAFB Landfill, if necessary, and recycled

when possible. Access to the VAFB Landfill requires a Landfill Access Ticket, which would be coordinated through 30 CES/CEV Compliance Office.

Construction debris, along with green waste, and other recyclable materials, would be segregated and diverted for reclamation. All green waste generated at VAFB would be disposed of at the VAFB Landfill. Any wastes resulting from the implementation of the Proposed Action on VAFB, that are not authorized to be disposed of in the VAFB Landfill would be segregated and taken to the Nipomo Transfer Station for recycling or disposal. All C&D debris generated at PPAFS would be taken to the Ox Mountain Sanitary Landfill.

To meet VAFB's detailed tracking requirements for waste disposal and diversion, the party/unit responsible for diversion, recycling, or disposal must report all materials going off Base to the 30 CES/CEV Compliance Office, Solid Waste Manager.

For any demolition that would occur under the Proposed Action, generation of demolition debris and materials and items removed from facilities have the potential of adversely affecting waste volumes at the VAFB Landfill, particularly for acceptance of non-friable asbestos and demolition debris that could not be reused, recycled or placed as engineered fill. The demolition contractor would meet the applicable state or local diversion requirements (for VAFB and PPAFS) in effect at the time of actual disposal. In addition, although the VAFB Landfill is permitted for a peak daily tonnage of approximately 400 tons, the demolition contractor would limit daily landfill disposal so the VAFB Landfill could continue to operate nearer its current daily average disposal tonnage of 35 tons/day. Useable items and material removed during demolition would directly impact the reutilization, transfer, donation and sale (RTDS) process of the local DRMO, and could indirectly impact regional Defense Logistic Agency RTDS centers. Recyclable solid wastes not managed by Air Force and DoD processes would impact local and regional recycling facilities.

The evaluation of potential P2 impacts includes solid waste diversion requirements, particularly as applied to demolition debris. Non-compliance with applicable regulatory requirements or disposal of quantities of solid waste that would cause the proposed project not to meet mandated diversion rates would be considered an adverse impact. The placement of certain items and installed equipment removed from facilities into the DRMO RTDS process would increase the amounts of materials handled above normal operations. Debris would be segregated to facilitate subsequent P2 options. P2 options would be exercised in the following order: reuse of materials, recycling of materials and then regulatory compliant disposal.

Compliance with all applicable federal, state, and local regulations, rules and requirements, and applicable Air Force plans would govern all actions associated with implementing the Proposed Action and minimize the potential for adverse effects. Implementing the measures presented below would ensure no significant adverse impacts for solid waste would occur.

- Hazardous materials surveys and appropriate abatement actions would be completed prior to structural demolition to avoid contamination of inert demolition debris.
- Prior to structural demolition, salvageable, reusable, or recyclable materials, items and equipment would be removed to reduce the amount of solid waste requiring landfill disposal.
- Segregating and separately managing the different types of waste during the deconstruction and demolition processes would reduce the amount of solid waste requiring landfill disposal.
- Segregating and processing the different types of demolition debris into sizes, characteristics, and specifications identified by local recyclers as acceptable

to their authorized processes would reduce solid waste requiring landfill disposal.

- Segregating and processing the different types of demolition debris into sizes, characteristics, and specifications for reuse within other VAFB projects.
- Using segregated demolition debris, such as residual wood, drywall, roofing, and flooring, as feedstock for grinding to make demolition debris suitable for use as alternate daily cover at the VAFB or local landfill would count as diversion and minimize the amount of solid waste disposal.

Because projects associated with the Proposed Action would be implemented over a 2-year period, the addition of the solid wastes associated with the projects would result only in small increases in the amount of solid waste generated by VAFB and PPAFS. The amount of solid waste generated at VAFB would not affect the daily maximum waste that the VAFB Landfill can accept. The Proposed Action would have no adverse impacts on the environment.

4.6.1.2 Pollution Prevention

Construction operations associated with the Proposed Action would create pollution in the air and water and would generate hazardous and solid waste. Compliance with applicable regulatory requirements as well as the VAFB *Pollution Prevention Management Plan*, 30 SWP 32-7080, and implementation of the recommended measures for air quality, hazardous waste management, and solid waste management would enhance P2.

Contractors on VAFB and PPAFS must comply with affirmative procurement requirements as specified in federal regulations, and Air Force policies and plans, including Section 6002, Federal Procurement of the RCRA; EO 12873, Federal Acquisition, Recycling, Waste Prevention; EO 13149, Greening the Government; EO 13101, Greening the Government Through Waste Prevention, Recycling, and Federal Acquisition; AFI 32-7080, *Compliance Assurance and Pollution Prevention*; 30 SWP 32-7042, *Solid Waste Management Plan*; and 30 SWP 32-7080, *Pollution Prevention Management Plan*.

The contractor shall use specified materials with recycled and recovered content as the minimum standard, which shall be considered when evaluating recycled or reused materials as part of the contractor's affirmative procurement program. The contractor shall also consider other green materials and products not listed, but commonly used in industry outside of the Government as a means of further reducing hazardous materials, hazardous waste, and solid waste. The contractor shall make sure these materials and products meet the requirements of their contract specifications.

In addition, EO 13101 requires the use of products that have reduced toxicity and hazardous characteristics or reduced embodied energy in its manufacturing. The U.S. EPA provides comprehensive on-line P2 training in the World Wide Web (www.epa.gov/opptintr/epp/).

Compliance with the regulations, guidelines, and measures described above and further detailed in Section 4.6.2 should result in no adverse impacts to the environment.

4.6.2 Environmental Protection and Monitoring Measures

No potential adverse effects are anticipated during the operational phase of the Proposed Action. Strict compliance with applicable federal and state status and regulations, as well as following requirements contained in 30 SWP Plan 32-7042, *Solid Waste Management Plan*, should minimize solid waste generation during construction activities under the Proposed Action. Implementing the measures presented below should further minimize the potential for adverse impacts associated with solid waste during the construction phase.

- Hazardous materials surveys and appropriate abatement actions would be completed prior to structural demolition to

avoid contamination of inert demolition debris.

- Solid waste disposal would be minimized by:
  - Removing salvageable, reusable, or recyclable materials, items and equipment prior to structural demolition.
  - Segregating and separately managing the different types of waste during the demolition process.
  - Segregating and processing the different types of demolition debris into sizes, characteristics and specifications identified by local recyclers as acceptable to their authorized processes.

Compliance with the VAFB *Pollution Prevention Management Plan*, 30 SWP 32-7080, and implementation of the recommended measures for air quality, hazardous waste management, and solid waste management would enhance P2. Contractors would also comply with affirmative procurement requirements as specified in federal and Air Force policies, regulations and plans.

- If necessary, asphalt and concrete debris resulting from demolition activities on VAFB would be accepted at the VAFB Landfill, and recycled when possible. Access to the landfill requires a Landfill Access Ticket, which would be coordinated through the 30 CES/CEV P2 Office.
- To meet VAFB's detailed tracking requirements for waste disposal and diversion, the party/unit responsible for diversion, recycling, or disposal must report all materials going off Base for these purposes to the 30 CES/CEV P2 Office Solid Waste Manager. Additionally, any materials recycled on Base by processes other than the VAFB Landfill, must be reported to the 30 CES/CEV P2 Office Solid Waste Manager at least quarterly, with copies of weight tickets and receipts provided.
- The different types of demolition debris would be segregated and processed into sizes, characteristics and specifications for reuse within other VAFB projects.
- Demolition debris, such as residual wood, drywall, roofing, and flooring, would be segregated as feedstock for grinding to make demolition debris suitable for use as alternate daily cover at the VAFB Landfill.

4.6.3 Alternative B: No-Action Alternative

Under the No-Action Alternative, construction activities would not occur, therefore there would be no effects on Solid Waste Management at either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.7 Transportation

For the purposes of this EA, impacts to the transportation system at VAFB and PPAFS would be considered significant if:

- A primary roadway could no longer service the traffic demands of that roadway; or
- The project caused traffic to shift to a roadway that was incompatible with those traffic increases (i.e. inadequate pavement structure), or could cause potential safety problems, such as a large number of large trucks using a rural road with heavy pedestrian traffic.

4.7.1 Proposed Action (Alternative A)

None of the activities described under the Proposed Action (construction and operational phases) are of a magnitude that would result in an adverse effect on transportation at either VAFB or PPAFS. Construction activities would occur at sites that are not within primary roadways, and the number of personnel required for each project (four) would not have a noticeable effect on traffic within primary roadways. Construction-related truck trips would be a minor addition to existing traffic on roadways within VAFB

and PPAFS, as well as in the surrounding communities.

4.7.2 Alternative B: No-Action Alternative

Under the No-Action Alternative, construction activities would not occur, therefore there would be no effects on Transportation at either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.8 Water Resources

In California, the SWRCB and the RWQCB administer the CWA and state water regulations. The CWA defines the standards for water quality and mandates that treated water discharged to surface water or to the ocean are subject to the requirements of a NPDES General Construction Permit. The RWQCB is responsible for management of the NPDES General Construction Permit process for California. The Central Coast RWQCB is the local agency responsible for the VAFB area and the San Francisco RWQCB is the local agency responsible for the PPAFS area. The NPDES General Construction Permit for construction activities ensures that water discharged from a site meets water quality standards at the point of discharge. The NPDES General Construction Permit, along with contract requirements, and standard work practices, reduces and eliminates storm water and non-storm water discharges associated with proactive construction activities. BMP controls and site inspections evaluate and improve the effectiveness of the implementation of required actions and controls.

The California Porter-Cologne Water Quality Act provides a framework for establishing beneficial uses of water resources and the development of local water quality objectives to protect these beneficial uses. State regulations require a WDR for permitting discharge. A RWD (similar to an NPDES General Construction Permit application) is required for actions that will involve discharge of waste to surface and/or groundwater. The California Porter-Cologne Water Quality Act implements the NPDES program for the state.

Adverse impacts to water resources would occur if the Proposed Action 1) caused substantial flooding or erosion; 2) adversely affected surface water quality to creeks, rivers, streams, lakes, or bays; or 3) adversely affected surface or groundwater quality or quantity. An adverse effect to water resources would also be considered significant if it contributed to a shortage of water supply.

4.8.1 Proposed Action (Alternative A)

Construction activities under the Proposed Action would require a NPDES General Construction Permit as required by Section 402 of the CWA because the total disturbed area of the Proposed Action would be greater than one acre. The contractor would develop and implement a SWPPP to maintain compliance with the NPDES General Construction Permit. All permit conditions and BMPs would be implemented to minimize the potential for adverse impacts to local water resources. During site preparation and construction activities, storm water/erosion BMPs would be implemented during and after any clearing, excavation, and grading. Long-term BMPs would be put in place to address storm water erosion after project completion. After conclusion of construction activities, any disturbed/bare ground areas would be revegetated with appropriate plant and seed mix. In addition, the contractor would implement all NPDES General Construction Permit requirements until the Central Coast RWQCB (for construction activities at VAFB) and the San Francisco RWQCB (for construction activities at PPAFS) officially terminates the SWPPP or the SWRCB officially terminates the NDPES General Construction Permit covering the Proposed Action.

A Notice of Intent would be coordinated with 30 CES/CEV prior to submittal to the SWRCB. The contractor would also submit a Notice of Termination to the Central Coast

RWQCB (for construction activities at VAFB) and the San Francisco RWQCB (for construction activities at PPAFS) after coordination with 30 CES/CEV to ensure all permit termination requirements are met.

A CWA Section 401 Water Quality Certification from the Central Coast RWQCB (for construction activities at VAFB) and from the San Francisco RWQCB (for construction activities at PPAFS) and CWA Section 404 Permit from the U.S. Army Corps of Engineers would not be required under the Proposed Action because no direct impacts to water bodies or wetlands would occur. There are no direct discharges from the Proposed Action into any of the CWA Section 303 (d) listed water bodies on VAFB or PPAFS.

The contractor would implement all permit conditions; contract requirements (including any federal guidelines and regulations addressing site processes for all compliance medias); *Discharge to Grade Program*; and VAFB Management Plan requirements. The contractor would incorporate these requirements into work practices and procedures to ensure compliance for all project related activities. With the implementation of these procedures and requirements, adverse effects to water resources would be less than significant, as described below.

The greatest threat to groundwater is contamination from hazardous material or waste releases that could infiltrate an aquifer. Proper management of materials and wastes during construction activities would reduce or eliminate the potential for contaminated runoff. The use of POLs during construction poses the potential for releasing pollutants and adversely affecting water resources. This potential would be greatest during the rainy season.

As required by the NPDES General Construction Permit, BMPs would be implemented to properly manage materials. Storm water or wastewater discharges that may occur during construction activities would also be managed through implementation of BMPs, as required by the NPDES General Construction Permit. The *Discharge to Grade Program* would also assist with the management of storm water and wastewater discharges. The NPDES General Construction Permit would cover all construction and staging areas. Implementing BMPs as part of the NPDES General Construction Permit to reduce and/or eliminate project-associated runoff would further reduce the potential for adverse effects, especially during the rainy season. With these measures in place, adverse effects to surface water and floodplains would be less than significant.

No adverse effects are anticipated during the operational phase of the Proposed Action. Implementing the environmental protection measures described in Section 4.8.3, during the construction phase, should avoid adverse effects to water resources.

4.8.2 Environmental Protection and Monitoring Measures

Compliance with NPDES Construction General Permit conditions should minimize potential adverse impacts to water resources. Contractors would develop and implement a SWPPP approved by 30 CES/CEV prior to initiation of any construction activities under the Proposed Action. NPDES Construction General Permit BMPs and *Discharge To Grade Program* procedures should minimize the potential for adverse impacts to local water resources.

A Notice of Intent would be submitted to the SWRCB. At the conclusion of each construction project, a Notice of Termination would be submitted to the Central Coast and San Francisco RWQCBs to ensure all permit termination requirements are met. The Notice of Intent and Notice of Termination would be coordinated with 30 CES/CEV and signed by the 30th Civil Engineer Squadron Commander (30 CES/CC) or Deputy Commander (30 CES/CD) prior to submittal.

In addition, implementation of the measures described below should further reduce the potential for adverse effects to water resources:

- BMPs, including erosion and sediment control, proper spill prevention practices for all stored liquids and construction vehicles, and permanent erosion control, would be implemented to prevent sediment or chemicals from entering stream waters.
- Approval would be obtained from the 30 CES/CEV Compliance Office, Water Resources Manager, prior to any release to grade of any water (*Discharge to Grade Program*).
- On VAFB, industrial wastewater (water containing prohibited chemical levels) would be taken to the industrial wastewater treatment ponds.
- After completion of construction activities, areas with exposed disturbed soil would be stabilized per the NPDES Construction General Permit, as detailed in Section A, Item 7 on page 15 of the Permit.

4.8.3 Alternative B: No-Action Alternative

Under the No-Action Alternative, construction activities would not occur, therefore there would be no effects on Water Resources at either VAFB or PPAFS. However, the No-Action Alternative would not meet the purpose and need of the Proposed Action.

4.9 Cumulative Impacts

Adverse cumulative impacts (hereinafter referred to as "cumulative impacts") result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency that undertakes these other actions. Cumulative impacts can result from actions whose adverse impacts are individually minor or negligible, yet, over a period of time, are collectively significant.

Under the 2007 General Plan for VAFB, 13 construction projects under the capital improvements program (CIP) would be constructed within the main and south Base cantonment areas over a period of five years (2007 through 2012). The potential environmental consequences associated with these construction projects were analyzed in the Programmatic Environmental Assessment for the 2007 General Plan for the Main Cantonment and the South Base Cantonment at Vandenberg Air Force Base, California (VAFB 2008). In addition, VAFB has an on-going operations and maintenance (O&M) program for Base facilities (also known as sustainment). O&M includes activities such as corrosion control, landscaping, paving, roofing, etc. There are over 300 O&M projects planned for fiscal year (FY) 07 to FY12 (VAFB 2007). Given that these projects are spread throughout the Base and the small scale of their operations, no significant cumulative impacts are anticipated with these activities.

Current projects at VAFB for which NEPA analysis, including cumulative impacts analysis, was completed include: demolition and abandonment of Atlas and Titan facilities and installation of fiber optic lines associated with the Combat Information Transport System (CITS) upgrade. Future projects for which NEPA analysis is currently underway include: security and safety upgrades at entry control facilities, and San Antonio Creek restoration, both on VAFB. Future projects planned but for which NEPA analysis has not been initiated include the upgrade of facilities and equipment at the Honda Ridge tracking facility on VAFB.

Air quality impacts were considered in conjunction with on-going and future projects planned at VAFB and PPAFS. The cumulative emissions from projects included under the Proposed Action, and past, present, and future projects, would not exceed the significance thresholds in Santa Barbara County or San Mateo County. Because any project that would cause an exceedance would be postponed until the following calendar year, no significant cumulative impacts to the regions' air quality would occur.

Adverse effects to biological and cultural resources should be minimized with the implementation of measures described in Section 2.5 of this EA, identified in the

environmental assessments completed for other projects, to be incorporated in environmental assessments currently under development for future projects, and identified and established by VAFB for CIP construction projects, and O&M projects. With these measures in place, no significant cumulative impacts are anticipated.

No impacts to earth resources are anticipated from the Proposed Action, from the demolition and abandonment of Atlas and Titan facilities, from the CITS upgrade, from the CIP construction projects, or from O&M projects. Environmental Assessments under development for future projects would identify any potential adverse effects to earth resources and describe measures to avoid or minimize these adverse effects. No cumulative impacts are anticipated.

When considered in conjunction with other past, present, and future projects, the Proposed Action was found to have no cumulative impacts on Environmental Justice, as activities covered under this EA would be confined to VAFB and PPAFS and not affect minority communities.

Hazardous materials/wastes encountered or generated during the Proposed Action would be managed in strict compliance with all applicable statutes and regulations, including: local support plans and instructions (i.e., 30 SWP 32-7086, *Hazardous Materials Management Plan*; 30 SWP 32-7043A, *Hazardous Waste Management Plan*; 30 SWP 32-1052A, *Asbestos Management Plan;* and 30 SWP 32-1002, *Lead Based Paint Management Plan*) to avert the potential for adverse impacts. Implementing the measures described in Sections 4.1 through 4.8 of this EA, identified in the environmental assessments completed for other projects, to be incorporated in environmental assessments currently under development for future projects, and identified and established by VAFB for O&M projects, should avoid or minimize any potential adverse effects. No significant cumulative impacts are anticipated.

Given contractors' requirement to comply with federal OSHA, California OSHA, and all other applicable federal, state, and local regulations, no adverse impacts and therefore no cumulative impacts to Human Health and Safety are anticipated.

No cumulative impacts are anticipated in regards to land use as none of the projects considered within this EA would change land use or result in adverse effects. Projects covered under the Proposed Action would not result in the conversion of prime agricultural land to other uses.

No adverse impacts to socioeconomics and therefore no cumulative impacts are expected from projects included under the Proposed Action, given the small numbers of personnel utilized for projects, and the short-term nature of the activities.

High levels of solid waste are not anticipated to occur under the implementation of the Proposed Action. Construction debris would be segregated and diverted for reclamation and solid waste would also be minimized by reuse and recycling. Contractors would also be required to appropriately dispose of all solid waste either at the VAFB Landfill as appropriate, or off VAFB property. With these measures in place, no significant cumulative effects are anticipated.

Activities covered under the Proposed Action would be unlikely to impact the transportation system or roadway conditions on VAFB and PPAFS given that the activities would occur within small areas located outside of main transportation areas and roadways. No adverse effects such as temporary closures of roads or lanes are anticipated. No cumulative impacts are anticipated.

All activities under the Proposed Action would be subject to all requirements contained in the NPDES Construction General Permit. Implementation of measures described in this EA, identified in the environmental assessments completed for other projects, to be incorporated in environmental assessments currently under development for future projects, and identified and established for O&M projects, should avoid or minimize any potential adverse effects. No significant

cumulative impacts to water resources are anticipated.

To ensure that no significant cumulative impacts result from projects occurring concurrently or non-currently, VAFB includes environmental contract specifications and mitigation/protective measures as necessary in all projects. Actions are taken during the planning process to ensure adverse impacts are minimized or avoided all together as projects are reviewed under NEPA. Prior projects are also considered to ensure no levels of acceptable impacts are exceeded.

With these practices in place, and given that all VAFB projects are designed and implemented to be in full compliance with applicable statutes and regulations, and environmental protection measures are developed in coordination with appropriate regulatory agencies, the described projects included under the Proposed Action, in conjunction with other foreseeable projects at VAFB and PPAFS, would not result in significant cumulative impacts.

Chapter 5. Agencies and Persons Contacted

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Dina Ryan, Environmental Planner, 30 CES/CEV, VAFB

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Chapter 6. List of Preparers

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John Sipos, Environmental/Safety Engineer, ManTech SRS Technologies, Inc.
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Valorie Thompson, Principal, Scientific Resources Associated
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Years of Experience: 22

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Chapter 7. Distribution List

Bay Area Air Quality Management District, San Francisco, CA
California Coastal Commission, Federal Consistency Review, San Francisco, CA
California Native Plant Society, Los Osos, CA
California Regional Water Quality Control Board, Central Coast Region, San Luis Obispo, CA
Defense Technical Information Center (World Wide Web http://www.dtic.mil)
Environmental Defense Center, Santa Barbara, CA
Half Moon Bay Library, Half Moon Bay, CA
La Purisima Audubon Society, Lompoc, CA
Lompoc Public Library, Lompoc, CA
Pacifica-Sanchez Library, Pacifica, CA
Pacifica-Sharp Library, Pacifica, CA
Santa Barbara County Air Pollution Control District, Project Review, Santa Barbara, CA
Santa Barbara Museum of Natural History, Santa Barbara, CA
Santa Barbara Public Library, Santa Barbara, CA
San Francisco, Regional Water Quality Control Board, San Francisco, CA
San Mateo Library, San Mateo, CA
Santa Maria Public Library, Santa Maria, CA
Santa Ynez Chumash Indian Reservation, Tribal Elders Council, Santa Ynez, CA
University of California, Library, Santa Barbara, CA
University of California, Museum of Systematics & Ecology, Santa Barbara, CA
U.S. Fish and Wildlife Service, Ventura Field Office, Ventura, CA
Vandenberg Air Force Base Library, VAFB, CA

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Chapter 8. Bibliography

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Arnold, R.A. 1981. A review of endangered species legislation in the USA and preliminary research on 6 endangered California butterflies. Beih. Veroff. Naturschutz. Landschaftspflege Bad.-Wurtt. 21: 79-96.

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APPENDIX A

Cultural Resources

Appendix A – Cultural Resources

Vandenberg Area Prehistory

The prehistory of California's central coast spans the entire Holocene and may extend back to late Pleistocene times. Excavations on Vandenberg Air Force Base (VAFB) reveal occupations dating back 9,000 to 10,000 years (Glassow 1990, 1996; Lebow et al. 2001, 2006, 2007). These early occupants are thought to have lived in small groups that had a relatively egalitarian social organization and a forager-type land-use strategy (Erlandson 1994; Glassow 1996; Greenwood 1972; Moratto 1984). Human population density was low throughout the early and middle Holocene (Lebow et al. 2007) but cultural complexity appears to have increased around 3,000–2,500 years ago (King 1981, 1990). At VAFB, that interval also marks the beginning of increasing human population densities and appears to mark the shift from a foraging to a collecting land-use strategy (Lebow et al. 2006, 2007). Population densities reached their peak around 600–800 years ago, corresponding to the full emergence of Chumash cultural complexity (Arnold 1992).

People living in the VAFB area prior to historic contact are grouped with the Purisimeño Chumash (Greenwood 1978; King 1984; Landberg 1965), one of several linguistically related members of the Chumash culture. In the Santa Barbara Channel area, the Chumash people lived in large, densely populated villages and had a culture that "was as elaborate as that of any hunter-gatherer society on earth" (Moratto 1984:118). Relatively little is known about the Chumash in the Vandenberg region, but explorers noted that villages were smaller and lacked the formal structure found in the channel area (Greenwood 1978:520). About five ethnohistoric villages are identified by King (1984:Figure 1) on VAFB, along with another five in the general vicinity. Beginning with the maritime voyages of Cabrillo in A.D. 1542–1543 diseases introduced by early Euroamerican explorers, substantially impacted Chumash populations more than 200 years before Spanish occupation began (Erlandson and Bartoy 1995, 1996; Preston 1996). Drastic changes to Chumash lifeways resulted from the Spanish occupation that began with the Portolá expedition in A.D. 1769.

Vandenberg Area History

VAFB history is divided into the Mission, Rancho, Anglo-Mexican, Americanization, Regional Culture, and Suburban periods (Palmer 1999). The Mission Period began with the early Spanish explorers and continued until 1820. During this period, the Vandenberg area was within the lands controlled by Mission La Purísima, and farming and ranching were the primary economic activities. The Rancho Period began in 1820 and continued until 1845. Following secularization in 1834, the Alta California government granted former mission lands to Mexican citizens as ranchos. Cattle ranching was the primary economic activity during this period. The Bear Flag Revolt and the Mexican War marked the beginning of the Anglo-Mexican Period (1845–1880). Cattle ranching continued to flourish during the early part of this period, but severe droughts during the 1860s decimated cattle herds. The combination of drought and change in government from Mexican to the United States caused substantial changes in land ownership and sheep ranching and grain farming replaced the old rancho system. Increased population densities characterize the

Americanization Period (1880–1915). Beginning in the late 1890s, the railroad provided a more efficient means of shipping and receiving goods and supplies, which in turn increased economic activity. Ranching and farming continued during the early part of the period of Regional Culture (1915–1945), until World War II when property was condemned for construction of Camp Cooke. The Suburban Period (1945–1965) began with the end of World War II. In 1956, the army transferred 64,000 acres of North Camp Cooke to the Air Force, and it was renamed Cooke Air Force Base. In 1958 the base had its first missile launch, the Thor, and was renamed Vandenberg AFB (Palmer 1999).

Pillar Point Area Prehistory

The following is mostly excerpted from the Integrated Cultural Resources Management Plan (ICRMP) for Pillar Point Air Force Station (PPAFS) (Gerber et al. 2005). Relatively little evidence of late Pleistocene or early Holocene occupation exists in the area between San Francisco and Monterey bays. This was a time of rising sea water levels caused by post-Pleistocene warming trends in the global environment and the melting of glacial ice. During this time the ocean rose to cover the broad coastal plains filling the stream channels, and creating the San Francisco Bay until the sea level reached its current level about 6,000 years ago and the diversified regional coastal ecology seen today developed (Hylkema 1998:4).

Tantalizing suggestions of occupation during the Paleoindian Period occur in the form of fragmentary eccentric crescents from CA-SMA-134 (Hylkema 1998), CA-MNT-229 (Jones 1993), and CA-SCR-177 (Cartier 1993). Crescents are associated with great antiquity at sites in coastal and interior southern California, but their age and associations in the San Francisco Bay region remain to be clarified.

Radiocarbon-dated components at CA-SCL-178 near San Jose (Fitzgerald 1993), CA-SCR-177 in Scotts Valley (Cartier 1989, 1993), and CA-MNT-229 at Moss Landing (Jones 1993) attest to greater cultural activity during the Lower Archaic. Hylkema (2002) considers these components to be expressions of the southern California milling stone culture, although the exact relationships remain to be explained. Lower Archaic sites are still rare, perhaps because coastal inundation has obscured these occupations.

Numerous radiocarbon-dated components in San Francisco, San Mateo, Santa Clara, Santa Cruz, and Monterey counties represent the Middle Archaic Period, indicating sparse but widespread settlement of the region by semisedentary foragers using bayshore, marine, and upland resources. Sites contain large projectile points and milling stones, reflecting a balanced hunting and collecting economy. Sites contain shell but do not reflect intensive shellfish exploitation. Discovering evidence of this Middle Archaic adaptation in the lower components of several sites in coastal and interior Monterey County, Breschini and Haversat (1981) were the first to refer to this generalized adaptation as the Sur Pattern. It featured a generalized foraging economy, and earth or sand deposits with less shell than is found in later middens mark settlements. Inferred land use involved seasonal residential moves among resource patches and the gathering of resources on an encounter basis, with little or no food storage. Considerable variability is evident in the size of forager groups, number of residential moves per year, and redundancy of land use from year to year. Coastal villages reflect a full range of economic activities, with relatively few task-specific sites reflecting only occasional extended resource procurement trips.

Beginning about 4,000 years ago, the San Francisco Bay area was settled by a bayshore and marsh-adapted people representing a new and distinctive adaptation. These people are thought to be Utian speakers, identifiable as the ancestors of the Miwok and Costanoans, who ultimately

spread throughout the Bay Area. Characteristics of sites during this period are rare milling stones but common, minimally shaped mortars and pestles; nonstemmed projectile point and an increasing emphasis through time on bone as opposed to flaked stone tools; and a minimally elaborated mortuary complex with flexed burials and only utilitarian grave goods. It is clear from the archaeological record that settlement differentiation, trade, social ranking, and ascribed status all developed during this period.

By the beginning of the Upper Archaic (circa 2500 B.P.), the ancestral Costanoans had colonized lands around the southern end of San Francisco Bay and had established villages along the coast as far south as the Monterey Peninsula. By A.D. 1, logistically organized collectors throughout most of Costanoan territory had replaced Sur Pattern foragers. This new adaptation, termed the Monterey Pattern by Breschini and Haversat (1981) and Dietz and Jackson (1981), is seen archaeologically in dense shell middens reflecting a specialized collecting economy focused on shellfish, fish, birds, and sea mammals. Many Upper Archaic coastal sites are task-specific locations used for collection of mollusks and other marine resources. These tend to be artifact-poor shell heaps—dense deposits of shell dietary refuse containing few tools other than occasional split pebbles and pitted stones. Settlements, containing a wider variety of artifacts, are located away from the exposed coast in more sheltered locations with access to a wider range of resources.

Later other new traits appeared, including increased population density, increasing status differentiation, a greater emphasis on gathering vegetal (as opposed to marine) foods, more intensive trade, and finally the appearance of clamshell disk beads as exchange currency. Moratto (1984:283) writes, “This was the emerging cultural pattern encountered and destroyed by the Spanish mission system and later historic developments.”

Pillar Point Area History

When the Spanish arrived in the Bay Area in 1769, they referred to the people already living in the region as “Costeños,” meaning coastal people. Anthropologists eventually transformed the name to Costanoan. The Costanoan languages, together with Miwok, compose the Utian language family of the Penutian stock. The population of contact-period Costanoan speakers was estimated at 7,000–10,000 people (Kroeber 1925; Levy 1978), divided into eight linguistic subgroups of contrasting dialect, custom, and subsistence focus. The Ramaytush subgroup (about 1,400 people) occupied the San Francisco peninsula in what are now San Francisco and San Mateo counties (Levy 1978).

The *Chiguan* tribelet occupied the area around Pillar Point. When first encountered by the Spanish, the *Chiguan* controlled an area of about 8 square miles from Pilarcitos Creek to Point Montara, occupying two villages. One, *Ssatumnumo*, was probably near the town of El Granada. The other, *Chagunte*, was probably located near Pillar Point.

Gaspar de Portola visited the Costanoan settlement of *Shalaihme*, just south of Half Moon Bay, in 1769 (Morall 1987). Missionization began in this area with the establishment of Mission Dolores in 1782. Many of the first Spaniards settling in this area were associated with the mission. Native populations became associated with the mission as well, resulting in rapid and ultimately tragic changes to native lifeways.

After California became part of the Republic of Mexico in 1821, secularization resulted in the confiscation of mission lands and subsequent land grants for agriculture and ranching. The Pillar Point and Fitzgerald Marine Reserve vicinity, termed the “*corral de tierra,*” was used for pasture lands for Mission Dolores and the San Francisco Presidio. The *corral de tierra* was divided into two large ranchos. The Coast side area began to grow in population by the 1870s, as the local economy focused more on agriculture. Whaling was part of the economy in this region for a brief

period in the 1870s. The first real road along this part of the coast was built in 1879, along Point Montara down past Fitzgerald Marine Reserve (Hylkema 1998:13). Individual towns remained small.

Agricultural use of the land around Pillar Point continued until the World War II era (Morall 1987). Out of concern that the Japanese would attack San Francisco, the U.S. Army bought 12.68 acres of Corral de Tierra ranch in 1940 to establish an artillery observation post. Several structures at PPAFS date to the World War II era, including concrete markers used as "datum points" and bunkers. The site was deactivated during the 1950s, but was reactivated in 1962 in support of the Minuteman I program. Currently, PPAFS houses radar, command control, meteorological, and telemetry systems to support missile activity at VAFB. Facilities at PPAFS provide data for the evaluation of ballistic missiles (Cole and Cagle 1995).

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APPENDIX B

Air Quality Analysis

Table B-1. Emissions summary.

	Daily Emissions (lbs/day)						Total Project Emissions (tons)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
VAFB - 2009												
Heavy Equipment	41.86	11.40	113.26	0.07	6.59	5.87	0.18	0.05	0.47	0.00	0.03	0.03
Construction Truck Trips	8.46	12.12	1.97	0.02	0.75	0.74	0.17	0.03	0.01	0.00	0.00	0.00
Worker Trips	2.47	0.25	0.14	0.00	0.01	0.01	0.15	0.01	0.01	0.00	0.00	0.00
Fugitive Dust					9.92	2.08					0.02	0.01
Subtotal VAFB - 2009	***52.79***	***23.77***	***115.36***	***0.09***	***17.28***	***8.70***	***0.49***	***0.09***	***0.49***	***0.00***	***0.06***	***0.04***
PPAFS - 2008												
Heavy Equipment	41.86	11.40	113.26	0.07	6.59	5.87	0.45	0.12	1.18	0.00	0.08	0.07
Construction Truck Trips	5.95	12.67	1.81	0.01	0.78	0.77	0.71	1.52	0.22	0.00	0.09	0.09
Worker Trips	2.47	0.25	0.14	0.00	0.01	0.01	0.15	0.01	0.01	0.00	0.00	0.00
Fugitive Dust					33.39	7.01					0.08	0.02
Subtotal PPAFS - 2008	***50.28***	***24.31***	***115.21***	***0.08***	***40.78***	***13.67***	***1.31***	***1.66***	***1.41***	***0.00***	***0.26***	***0.18***
PPAFS - 2010												
Heavy Equipment	41.86	11.40	113.26	0.07	6.59	5.87	0.45	0.12	1.18	0.00	0.08	0.07
Construction Truck Trips	4.64	10.98	2.13	0.02	0.41	0.41	0.56	1.32	0.26	0.00	0.05	0.05
Worker Trips	1.52	0.14	0.09	0.00	0.01	0.01	0.09	0.01	0.01	0.00	0.00	0.00
Fugitive Dust					33.39	7.01					0.08	0.02
Subtotal PPAFS - 2010	***48.02***	***22.52***	***115.48***	***0.08***	***40.41***	***13.30***	***1.10***	***1.45***	***1.44***	***0.00***	***0.21***	***0.14***

Table B-2. Construction heavy equipment emissions factors.

Equipment	Fuel	Hp	Load Factor	No. of Equip	Usage (Hrs/Day)	Days in Service	Emission Factors (lb/bhp-hr)				
							CO	VOC	NO_X	SO_X	PM_{10}
Excavator	DIESEL	184	57	1	8	5	0.005953	0.001499	0.018012	0.000011	0.000838
Vibrator/Compactor	DIESEL	105	43	1	8	1	0.007694	0.002183	0.019291	0.000011	0.001521
Forklift	DIESEL	94	30	1	8	120	0.007694	0.002183	0.019291	0.000011	0.001521
Concrete Boom Pump with Drum Mixing Truck	DIESEL	21	57	1	8	4	0.011023	0.003968	0.015212	0.000011	0.001676
Concrete Saw	DIESEL	7.5	73	1	8	1	0.011023	0.003968	0.015212	0.000011	0.001676
Tandem Vibratory Smooth Drum Roller	DIESEL	33	56	1	8	1	0.011023	0.003968	0.015212	0.000011	0.001676
40 Ton Crane	DIESEL	165	43	1	8	14	0.005953	0.001499	0.018012	0.000011	0.000838
Backhoe/Trencher/Dozer	DIESEL	108	55	1	8	5	0.007694	0.002183	0.019291	0.000011	0.001521
Generator	DIESEL	21	74	1	8	3	0.011023	0.003968	0.015212	0.000011	0.001676
Asphalt Roller	DIESEL	95	56	1	8	2	0.007694	0.002183	0.019291	0.000011	0.001521
Dump Truck	DIESEL	479	57	1	8	2	0.005953	0.001499	0.018012	0.000011	0.000838
Water Truck	DIESEL	189	50	1	8	2	0.005953	0.001499	0.018012	0.000011	0.000838

SOURCE: CECOR Construction Emissions Calculations: Off-Road equipment; year 1999.

Table B-3. Construction heavy equipment emissions.

Equipment	Daily Emissions (Lbs/day)						Total project Emissions (Tons)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
VAFB												
Excavator	4.9944	1.2578	15.1127	0.0091	0.7029	0.6256	0.0125	0.0031	0.0378	0.0000	0.0018	0.0016
Vibrator/Compactor	2.7791	0.7884	6.9677	0.0039	0.5495	0.4890	0.0014	0.0004	0.0035	0.0000	0.0003	0.0002
Forklift	1.7358	0.4924	4.3519	0.0024	0.3432	0.3054	0.1041	0.0295	0.2611	0.0001	0.0206	0.0183
Concrete Boom Pump with Drum Mixing Truck	1.0556	0.3800	1.4567	0.0010	0.1604	0.1428	0.0021	0.0008	0.0029	0.0000	0.0003	0.0003
Concrete Saw	0.4828	0.1738	0.6663	0.0005	0.0734	0.0653	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000
Tandem Vibratory Smooth Drum Roller	1.6297	0.5867	2.2489	0.0016	0.2477	0.2205	0.0008	0.0003	0.0011	0.0000	0.0001	0.0001
40 Ton Crane	3.3786	0.8509	10.2235	0.0061	0.4755	0.4232	0.0237	0.0060	0.0716	0.0000	0.0033	0.0030
Backhoe/Trencher/Dozer	3.6563	1.0372	9.1669	0.0051	0.7229	0.6434	0.0091	0.0026	0.0229	0.0000	0.0018	0.0016
Generator	1.3704	0.4933	1.8912	0.0013	0.2083	0.1854	0.0021	0.0007	0.0028	0.0000	0.0003	0.0003
Asphalt Roller	3.2746	0.9289	8.2101	0.0046	0.6474	0.5762	0.0033	0.0009	0.0082	0.0000	0.0006	0.0006
Dump Truck	13.0017	3.2745	39.3422	0.0236	1.8299	1.6286	0.0130	0.0033	0.0393	0.0000	0.0018	0.0016
Water Truck	4.5001	1.1334	13.6170	0.0082	0.6333	0.5637	0.0045	0.0011	0.0136	0.0000	0.0006	0.0006
Total - VAFB	***41.8592***	***11.3973***	***113.2551***	***0.0675***	***6.5944***	***5.8690***	***0.1768***	***0.0488***	***0.4652***	***0.0003***	***0.0317***	***0.0282***
PPAFS												
Excavator	4.9944	1.2578	15.1127	0.0091	0.7029	0.6256	0.0375	0.0094	0.1133	0.0001	0.0053	0.0047
Vibrator/Compactor	2.7791	0.7884	6.9677	0.0039	0.5495	0.4890	0.0042	0.0012	0.0105	0.0000	0.0008	0.0007
Forklift	1.7358	0.4924	4.3519	0.0024	0.3432	0.3054	0.2777	0.0788	0.6963	0.0004	0.0549	0.0489
Concrete Boom Pump with Drum Mixing Truck	1.0556	0.3800	1.4567	0.0010	0.1604	0.1428	0.0048	0.0017	0.0066	0.0000	0.0007	0.0006
Concrete Saw	0.4828	0.1738	0.6663	0.0005	0.0734	0.0653	0.0005	0.0002	0.0007	0.0000	0.0001	0.0001
Tandem Vibratory Smooth Drum Roller	1.6297	0.5867	2.2489	0.0016	0.2477	0.2205	0.0024	0.0009	0.0034	0.0000	0.0004	0.0003
40 Ton Crane	3.3786	0.8509	10.2235	0.0061	0.4755	0.4232	0.0710	0.0179	0.2147	0.0001	0.0100	0.0089
Backhoe/Trencher/Dozer	3.6563	1.0372	9.1669	0.0051	0.7229	0.6434	0.0183	0.0052	0.0458	0.0000	0.0036	0.0032
Generator	1.3704	0.4933	1.8912	0.0013	0.2083	0.1854	0.0034	0.0012	0.0047	0.0000	0.0005	0.0005
Asphalt Roller	3.2746	0.9289	8.2101	0.0046	0.6474	0.5762	0.0049	0.0014	0.0123	0.0000	0.0010	0.0009
Dump Truck	13.0017	3.2745	39.3422	0.0236	1.8299	1.6286	0.0195	0.0049	0.0590	0.0000	0.0027	0.0024
Water Truck	4.5001	1.1334	13.6170	0.0082	0.6333	0.5637	0.0045	0.0011	0.0136	0.0000	0.0006	0.0006
Total - PPAFS	***41.8592***	***11.3973***	***113.2551***	***0.0675***	***6.5944***	***5.8690***	***0.4486***	***0.1239***	***1.1809***	***0.0007***	***0.0806***	***0.0718***

Table B-4. Construction truck emissions.

Construction Phase	Vehicle Class	No. Vehicles	Speed (mph)	VMT (mi/ veh-day)	Days	CO		NO_X		VOCs						SO_X		PM_{10}			
						Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evap (g/mi)	Diurnal Evap (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Tire Wear (g/mi)	Brake Wear (g/mi)
VAFB																					
Foreman Truck	Light-duty truck, catalyst	1	15	40	120	9.161	18.885	0.893	0.895	0.444	1.509	0.343	0.045	0.093	0.106	0.007	0.002	0.032	0.017	0.008	0.013
Crew Pick-up Truck	Light-duty truck, catalyst	2	15	40	120	9.161	18.885	0.893	0.895	0.444	1.509	0.343	0.045	0.093	0.106	0.007	0.002	0.032	0.017	0.008	0.013
Debris Disposal Truck	Heavy-Duty Truck	3	15	90	2	9.72		19.948		3.01						0.025		1.165		0.036	0.028
PPAFS																					
CT-4A and CT-4B																					
Foreman Truck	Light-duty truck, catalyst	1	15	40	120	6.506	14.077	0.617	0.675	0.26	1.118	0.293	0.036	0.084	0.089	0.007	0.002	0.028	0.014	0.008	0.013
Crew Pick-up Truck	Light-duty truck, catalyst	2	15	40	120	6.506	14.077	0.617	0.675	0.26	1.118	0.293	0.036	0.084	0.089	0.007	0.002	0.028	0.014	0.008	0.013
Debris Disposal Truck	Heavy-Duty Truck	3	15	20	1	9.99		21.285		3.049						0.025		1.247		0.036	0.028
TM-B																					
Foreman Truck	Light-duty truck, catalyst	1	15	40	120	5.51	12.152	0.508	0.578	0.212	0.947	0.292	0.036	0.077	0.084	0.007	0.002	0.028	0.015	0.008	0.013
Crew Pick-up Truck	Light-duty truck, catalyst	2	15	40	120	5.51	12.152	0.508	0.578	0.212	0.947	0.292	0.036	0.077	0.084	0.007	0.002	0.028	0.015	0.008	0.013
Debris Disposal Truck	Heavy-Duty Truck	4	15	20	1	3.808		13.656		2.563						0.017		0.436		0.036	0.028

Construction Phase	Emissions (Lbs/day)						Emissions (Tons/trip)					
	CO	NOx	VOCs	SOx	PM_{10}	$PM_{2.5}$	CO	NOx	VOCs	SOx	PM_{10}	$PM_{2.5}$
VAFB												
Foreman Truck	0.89	0.08	0.06	0.00	0.00	0.00	0.0535	0.0050	0.0035	0.0000	0.0003	0.0003
Crew Pick-up Truck	1.78	0.17	0.12	0.00	0.01	0.01	0.1069	0.0099	0.0070	0.0001	0.0006	0.0006
Debris Disposal Truck	5.79	11.87	1.79	0.01	0.73	0.72	0.0058	0.0119	0.0018	0.0000	0.0007	0.0007
Total VAFB	**8.46**	**12.12**	**1.97**	**0.02**	**0.75**	**0.74**	**0.1662**	**0.0268**	**0.0123**	**0.0001**	**0.0016**	**0.0016**
PPAFS												
CT-4A and CT-4B												
Foreman Truck	0.64	0.06	0.04	0.00	0.00	0.00	0.0381	0.0034	0.0023	0.0000	0.0003	0.0003
Crew Pick-up Truck	1.27	0.11	0.08	0.00	0.01	0.01	0.0763	0.0069	0.0047	0.0001	0.0005	0.0005
Debris Disposal Truck	1.32	2.82	0.40	0.00	0.17	0.17	0.0793	0.1689	0.0242	0.0002	0.0104	0.0103
Total CT-4A and CT-4B	**3.23**	**2.99**	**0.52**	**0.01**	**0.19**	**0.18**	**0.1937**	**0.1793**	**0.0312**	**0.0003**	**0.0112**	**0.0111**
TM-B												
Foreman Truck	0.54	0.05	0.03	0.00	0.00	0.00	0.0324	0.0028	0.0020	0.0000	0.0003	0.0003
Crew Pick-up Truck	1.08	0.09	0.07	0.00	0.01	0.01	0.0647	0.0057	0.0040	0.0001	0.0005	0.0005
Debris Disposal Truck	0.67	2.41	0.45	0.00	0.09	0.09	0.0403	0.1445	0.0271	0.0002	0.0053	0.0052
Total TM-B	**2.29**	**2.55**	**0.55**	**0.00**	**0.10**	**0.10**	**0.1374**	**0.1530**	**0.0331**	**0.0003**	**0.0061**	**0.0060**

NOTES:

Assuming 40 miles round trip per vehicle except disposal trips, 90 miles round trip at VAFB and 20 miles round trip at PPAFS

Assume startup after 8 hours

Assume 45 minutes run time total

SOURCE: 2010 Emission Factors from EMFAC2007, average temp 60F

Table B-5. Fugitive dust emissions.

	Demolition Debris (ft^3)	Demolition Emissions (0.00042 Lbs PM_{10}/ft^3)	Soil Excavated (ft^3)	Materials Handling Emissions (Lbs/day)	Total (Lbs)	Total (Tons/yr)
VAFB						
TM-B (ATTAS Replacement)	900	0.3780	26,700	49.25	49.62	0.0248
TM-B (GRK-7 Replacement)	5,890	2.4738	26,638	49.13	51.61	0.0258
PPAFS						
CT-4A and CT-4B	2,300	0.9660	19,138	35.30	36.26	0.0181
TM-B	8,200	3.4440	24,080	44.41	47.86	0.0239
AN/FPQ-6 Modification	171	0.0718	5,500	10.14	10.22	0.0051
Total PPAFS	**10,671**	**4.4818**	**48,718**	**89.86**	**94.34**	**0.0472**

Table B-6. Construction worker commute emissions.

Construction Phase	Vehicle Class	Workers/ Phase	Speed (mph)	VMT (mi/veh-day)	CO		NO_X		VOCs						SO_X		PM_{10}			
					Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Hot-Soak (g/trip)	Resting Loss (g/hr)	Running Evap (g/mi)	Diurnal Evap (g/hr)	Running Exhaust (g/mi)	Start-Up (g/start)	Running Exhaust (g/mi)	Start-Up (g/start)	Tire Wear (g/mi)	Brake Wear (g/mi)
Year 2008																				
PPAFS CT-4A and CT-4B	Light-duty truck, catalyst	4	35	40	4.349	14.077	0.452	0.675	0.098	1.118	0.293	0.036	0.084	0.089	0.004	0.002	0.011	0.014	0.008	0.013
Year 2009																				
Oak Mountain	Light-duty truck, catalyst	4	35	40	6.061	18.885	0.657	0.895	0.173	1.509	0.343	0.045	0.093	0.106	0.004	0.002	0.013	0.017	0.008	0.013
Year 2010																				
PPAFS TM-B	Light-duty truck, catalyst	4	35	40	3.697	12.152	0.373	0.578	0.08	0.947	0.292	0.036	0.077	0.084	0.004	0.002	0.011	0.015	0.008	0.013

Construction Phase	Emissions (Lbs/day)						Days	Total Project Emissions (Tons)					
	CO	NO_X	VOCs	SO_X	PM_{10}	$PM_{2.5}$		CO	NO_X	VOCs	SO_X	PM_{10}	$PM_{2.5}$
Year 2008													
PPAFS CT-4A and CT-4B	1.7823	0.1713	0.0990	0.0014	0.0115	0.0114	120	0.1069	0.0103	0.0059	0.0001	0.0007	0.0007
Year 2009													
Oak Mountain	2.4710	0.2475	0.1382	0.0014	0.0123	0.0122	120	0.1483	0.0149	0.0083	0.0001	0.0007	0.0007
Year 2010													
PPAFS TM-B	1.5184	0.1418	0.0865	0.0014	0.0116	0.0114	120	0.0911	0.0085	0.0052	0.0001	0.0007	0.0007

NOTES:

Assuming 40 miles round trip per vehicle
Assume startup after 8 hours
Assume 45 minutes run time total

APPENDIX C

CT-4A and CT-4B RF Energy Emission

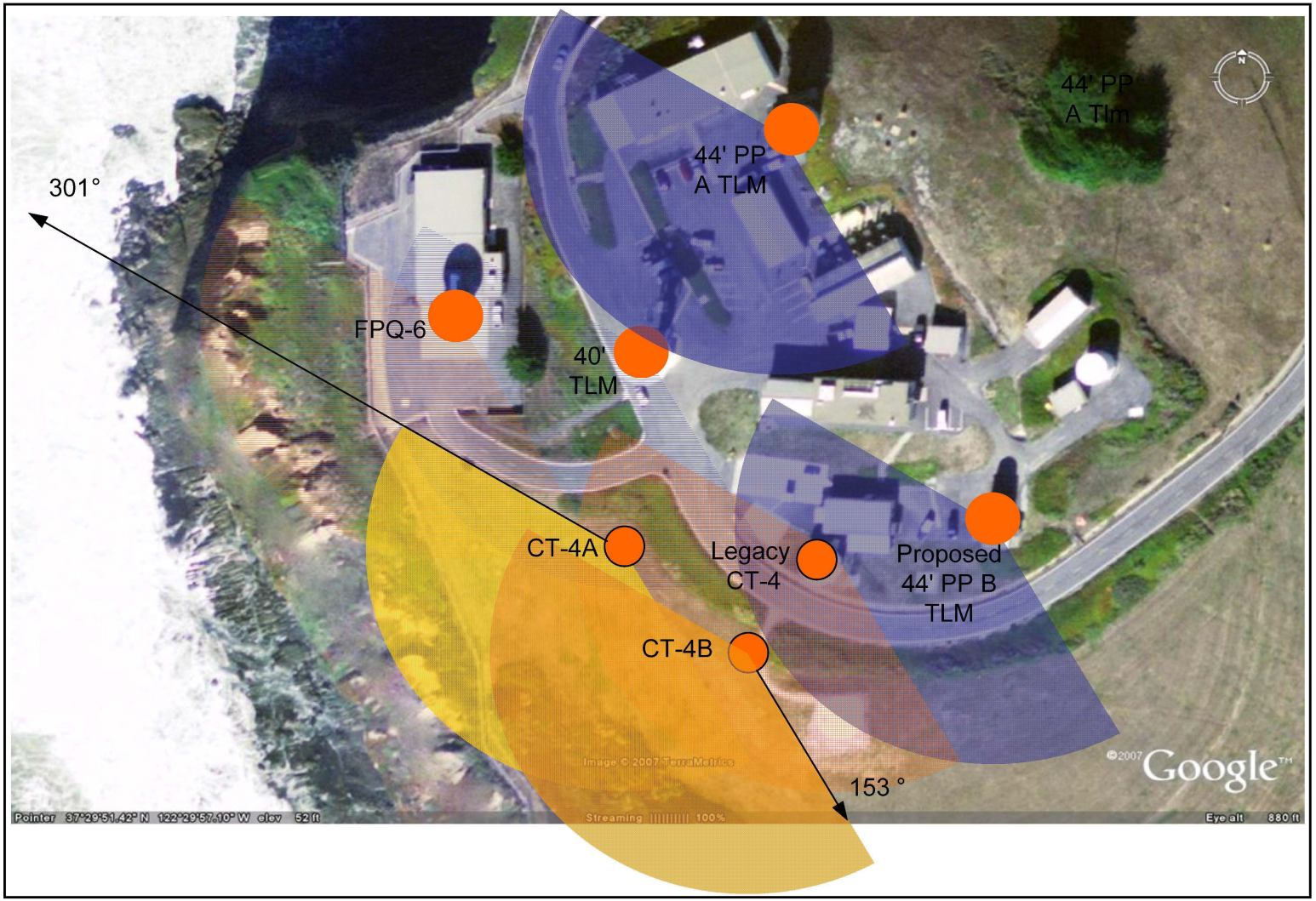

Figure C-1. Placement and coverage of CT antennas at Pillar Point.

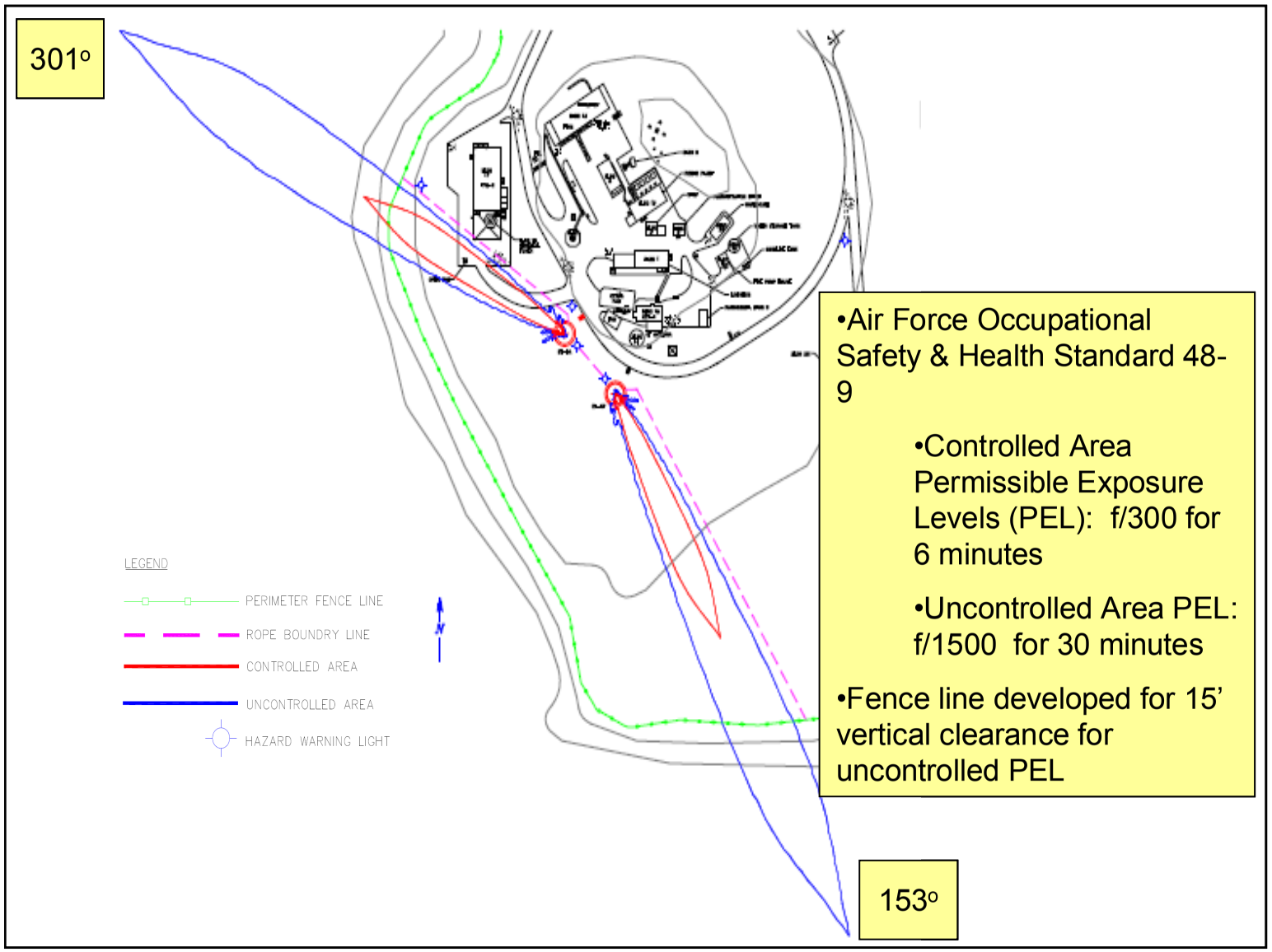

Figure C-2. CT- 4A and CT-4B radiation hazard profile - Extent of Azimuths

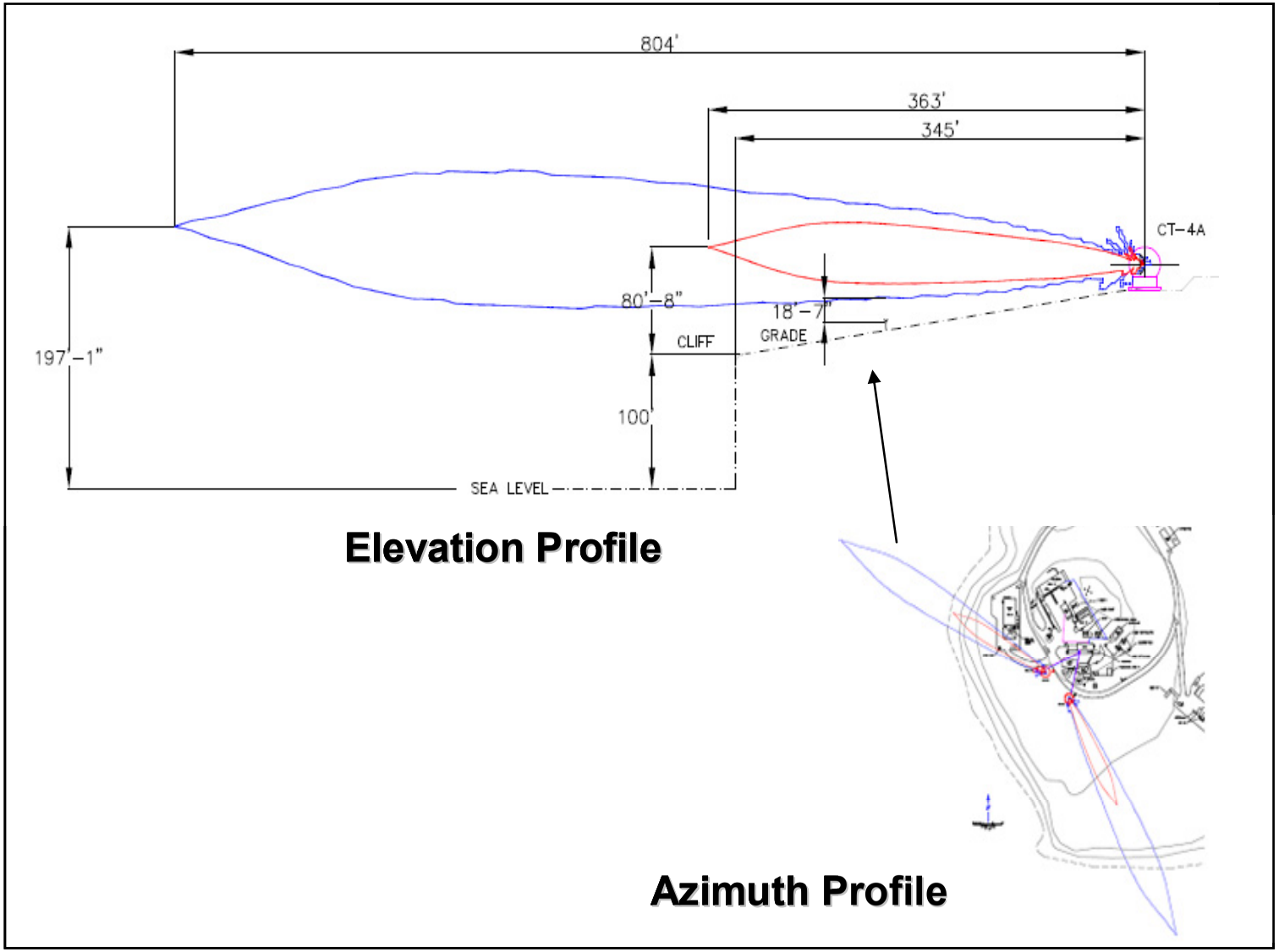

Figure C-3. CT- 4A radiation hazard vertical profile at 301º azimuth and 2º elevation.

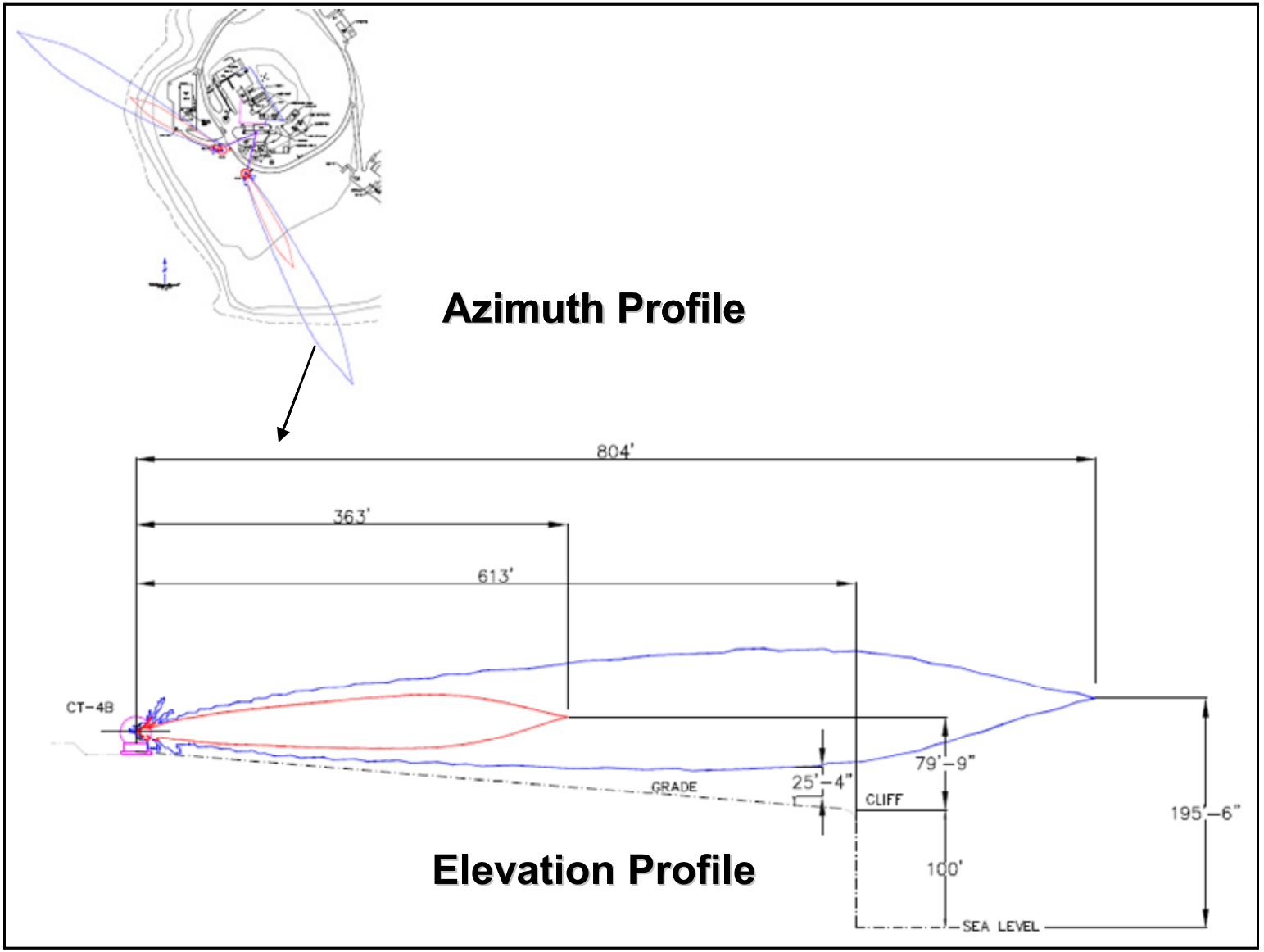

Figure C-4. CT- 4B radiation hazard vertical profile at 153º azimuth and 2º elevation.